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# American Aviation

APRIL 27, 1953 $1.00

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EQUIPMENT


One if by land... two if by sea

## But what if by air?

Surprise air attack is a possibility at any time. Long-range bombers equipped with atomic weapons could sneak by defenses – and only with the help of adequate detection can our Air Force and Army discourage and prevent such attack.

Radar alone cannot accomplish this. We are short 300,000 pairs of loyal American eyes for the Ground Observer Corps.

*JOIN NOW! CONTACT YOUR LOCAL CIVIL DEFENSE DIRECTOR OR WRITE TO: GROUND OBSERVER CORPS, U.S. AIR FORCE, WASHINGTON 25, D.C.*

This advertisement contributed in the interest of national defense by Convair


ANNUAL AIR TRANSPORT PROGRESS ISSUE

* Military * Commercial * Worldwide

## AN IMPORTANT CONTRIBUTION TO AUTOMATIC FLIGHT

A device that enables aircraft to maintain a constant selected altitude can be a boon to aviation.

Such a device is the new Honeywell Altitude Control. Many times more sensitive and accurate than any other altitude control, it senses and gives usable signals for displacements of two feet at 65,000 feet of altitude. It makes possible vastly improved bombing accuracy and ease of flight.

Constant altitude, in itself and as it contributes to constant airspeeds, is a vital factor in determining bomb trajectory. With constant altitude and airspeed thus assured, the bombardier's calculations are made easier, his accuracy increased.

And in formation flying, the Altitude Control virtually eliminates control jockeying, greatly simplifying the pilot's job and delivering more miles per pound of fuel.

Unlike other controllers, the Honeywell Altitude Control gives signals for *rate of displacement* and integral control as well as for displacement. Taken together and fed into the autopilot circuit, they give unprecedented altitude control.

The remarkable new Altitude Control is another Honeywell first. And there will be others, too. Because automatic controls are essential to aviation progress. And automatic control is Honeywell's business.

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**Honeywell**

H HONEYWELL *Aeronautical Controls*

**The aviation industry** entered the 50th anniversary year of powered flight with the same feeling as the average bank clerk. It was handling a tremendous amount of money but couldn't keep much of it.

**Uncle Sam claimed $192 million** in taxes from the manufacturers, up from $95 million in 1951. Scheduled airline taxes passed the $49 million mark.

**Manufacturers' backlog passed $14 billion;** eight companies have backlogs over one billion dollars, two exceed two billion despite record deliveries. Net profits were up 42% in 1952 for manufacturers, reaching industry total of $114,400,000. Net profit on sales up from 2.04% to 2.33% over previous year.

•

**Rising costs continued to plague airlines.** Despite all-time record revenues, $1,130 million for scheduled airlines, net operating revenues were down 15%, even *before taxes.* Yield per revenue passenger-mile was down, primarily due to coach fares. Mail pay as percentage of total revenues dropped from 5.6% in '51 to only 4.7% in '52.

**Increased business did not catch up** to increased passenger capacity of new equipment. Result: passenger load factor of domestic lines dropped 2.5%, cut almost $10 million from revenues. Trend worth watching.

•

**Biggest news: coach fares,** at home and abroad. Infant domestic coach business, four years old, produced over $100 million in revenues. Business virtually doubled over 1951. Number of coach passengers was up from 1.5 million in '51 to 2.4 million last year. Domestic coach on verge of another major expansion.

**Fifty-five per cent of the 340,000** passengers who flew across the North Atlantic after May 1, when tourist service was introduced, used low-fare services. Overall traffic in period was up 38%. U. S. carriers' share of North Atlantic coach was 42.3%, appreciably below their 52.3% share of first class.

•

**Orders for all-cargo aircraft** and proposed Flying Tiger/Slick merger highlighted cargo developments. In field noted for obsolescent equipment, 32 all-cargo ships are on order or recently delivered. Combination passenger/cargo carriers took lead from all-cargo operators in ton-miles carried by slim margin.

**Shipment weights continue small.** Over 54% of all shipments weighed less than 100 pounds. Only 5.7% of shipments exceeded 500 pounds. Average weight per piece shipped was under 35 pounds.

•

**Wait-and-see attitude** has set in among airline operators of the world. Orders for new aircraft are off appreciably. Jets, turbojets, and turboprops appear to be unnerving factor.

**Manufacturers can't afford** to build them, can't afford not to.

**Airlines can't afford** to operate them, can't afford not to. Economic booby traps of building or operating jets drive away conservative investors. Commercial transport backlog remains at almost one-half-billion-dollar level, but new orders are scarce.

•

**Eighty-million-dollar initial investment** in aircraft and equipment and annual expenditures of $15 million have been established as basis of corporation aircraft operations by most comprehensive survey of group ever undertaken.

**Operators of single-engine equipment** outnumber multi-engine users by five to one, but multi-engine operators spend 250% more annually. More than half the total group of over 5,000 corporate users plan expanding activity.

•

**Changing complexion of lightplane production** is evident in 1952 shipments which were up 32.8% over 1951 for record year since 1946 boom. Of the 3,058 lightplanes shipped, valued at $26,159,000, 82% were four place or larger. This contrasts with 1946 when 90% of the planes produced were one and two place.

# The Washington View

## Object Lesson for Wilson?

Repercussions growing out of the Congressional investigation into the ammunition shortage in Korea may yet prove a powerful factor in shaping the ultimate strength of the U. S. Air Force and the Navy's air arm.

There is every indication that the uniformed military brass have lost virtually all control of the Air Force's expansion program. Led by Defense Secretary Charles Wilson, Roger Kyes and Company, the new civil heads of Defense have taken firm hold. They are programming cutbacks, stretch-outs, and other functions without the apparent knowledge or agreement of the top generals or admirals. Result is that the aviation industry is getting directly contradictory stories on the status of major programs from top uniformed brass despite acknowledged goals and economy program initiated by Wilson.

Illustrative of current confusion: a comment attributed to Air Force Chief of Staff Hoyt S. Vandenberg when questioned regarding the adequacy of the program surviving current budget cuts—"I'm confident, but confused."

Now former Defense Secretary George C. Marshall has been cited as the man who made the specific decisions, against the advice of uniformed defense leaders, which led to the Korean ammunition shortage. Congress is proving highly critical of the whole situation, critical enough to make Wilson and Company slow down and take another look at the whole situation.

## Far-Reaching Proposal

Amid growing pressure from the new Republican Administration for economy in military and civil functions supported by Federal funds, Sen. Edwin C. Johnson (D., Colo.) has proposed a new plan for reducing overall air mail subsidies. The plan, outlined in a letter to the Civil Aeronautics Board in which he supported the industry's attempts to call off the general fare investigation, threw a new challenge at the Board and the industry.

Wrote Johnson, referring to the high-profit operators: "It would be far more sensible for the Board to compel such carriers to utilize these profits by assuming the operation obligations of the local service lines and smaller trunklines that now require subsidy."

Johnson's proposal has far-reaching possibilities and tends to substantiate the fears of some top airline executives who have watched the shifting Board policy toward the local service lines. For several months now these officials, noting the Board's reluctance to provide Central with a longer route renewal period and its action in the Pioneer equipment program, have felt the changing composition of the Board might see some of the small lines disbanded and the big operators once more saddled with this type of service.

It was Democratic Board member Josh Lee who did so much to promote the cause of the local service lines, and under the new Administration this cause seems to have lost favor. The tendency to cut overall subsidies to the local service lines, whether by cutting down the number of operators, assigning certain high cost low revenue stations to profitable lines, or devising a specific program as Senator Johnson suggests, is worth watching.

## Subsidy Hearing Coming?

Meanwhile, don't look for final Congressional action on legislation to separate subsidy from airmail payments during the present session. Despite the House Commerce Committee announcement that renewed consideration will be given pending bills, there are many valid signs backing views of veteran Hill observers that no final action is likely.

Subsidy separation has the vague support of the industry, but the only one to gain appreciably from separation would be the Post Office. At present the Post Office handles the whole air mail appropriation, service pay plus subsidy, and would like to get the subsidy portion handled directly by CAB.

First intimation that the House group would open an inquiry was the tentative scheduling for May 5 of a public hearing on the general subject of separation of subsidy from airmail payments. Sponsors of subsidy separation measures have already been heard once by the committee. They are: Reps. Heselton (H. R. 131), Clare Hoffman (H. R. 287), Hale (H. R. 3297), and Rooney (H. R. 4222).

This in itself is significant. Last year there were 10 such bills under consideration. This year only four. No small factor in this reduced interest is CAB's own subsidy separation which accomplishes the basic intent by identifying the portion of mail pay that can be considered subsidy. Also, the voluminous records of the Senate's hearings of last year into this very same type legislation is readily available and still timely.

Finally, even if the House should act on one of the bills, the Senate committee under Senator Tobey (R., N. H.) is well occupied with other matters and shows no inclination during this session of following through.

. . . Preble Staver

This is our silver anniversary year. Back in 1928, three Braniff pioneers, armed with a four-passenger Stinson and a certificate to operate a 116-mile route, started flying from Oklahoma City to Tulsa.

## *Observing Twenty-five Years of Public Service*

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**April 27, 1953** **Vol. 16, No. 24**

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**American Aviation Daily,** a daily news service for the entire industry. $300 per year. Managing Editor: Keith Saunders.

**American Aviation Directory;** twice yearly listing of products, people and organizations. $7.50 each. Managing Editor: Marion E. Grambow.

**Official Airline Guide;** Monthly publication of airline schedules and fares. $11 per year in USA and countries belonging to Pan American Postal Union, including Spain and the Philippines. $12.50 elsewhere. Published from 139 N. Clark St., Chicago 2, Ill. Central 6-5804. Managing Editor: Robert Farrish.

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## SINCLAIR AIRCRAFT OILS

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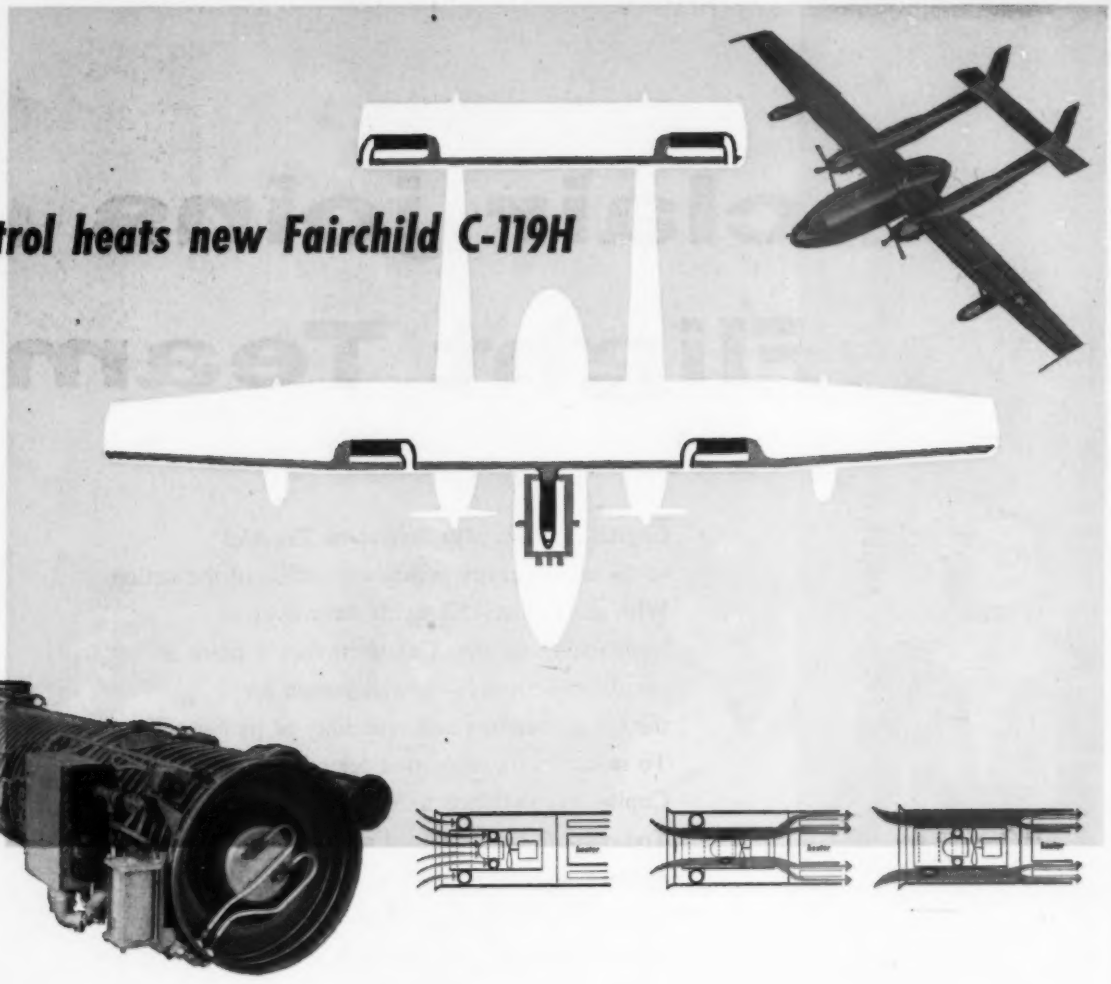
# janitrol heats new Fairchild C-119H



Inflatable air valves . . . modulating type fuel control valves . . . automatic blower over-run after shut-down . . . simpler-than-ever push button operation . . . interchangeability of components or complete units—these headline the brand new Janitrol S-600 heater packages, five of which heat the new C-119H. The inflatable air valves shown above represent the latest simplification of air intake control, and have proved themselves in the severest tests. Modulation of fuel supply is another important innovation: the system idles during periods of low heat demand, thereby avoiding the sudden temperature changes which would normally be experienced with on-off cycling.

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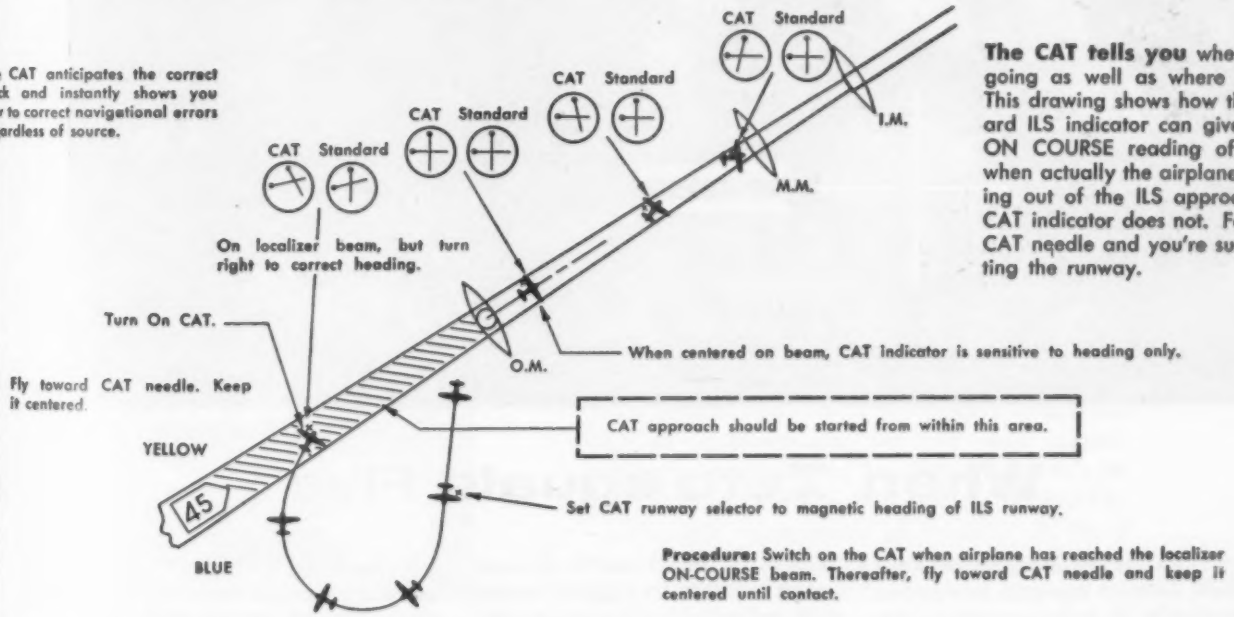
# SPECIAL NEWSLETTER

**Of vital interest to airline management, this newsletter describes the latest, simplest answer to the problem of precision ILS approach . . . the new *wilcox* CAT (Computing Automatic Tracker)**

Why the CAT? It's well known that a common fault of the ILS approach system is the problem of continuing the approach once the airplane has strayed off course...either because of turbulence, cross-wind or pilot's attention being diverted. If this happens during the latter phase of the approach, the pilot may find it impossible to regain proper alignment.

The CAT tells him when he's off course, when and how much to turn to get back on. It obtains heading and position information from the stabilized compass and localizer receiver equipment and computes a steering course signal for the pilot to follow.

Possible for unit to pay for itself in just a few missed approaches. The CAT eliminates fine bracketing at most critical part of the letdown. It eliminates chance of airplane being displaced from a safe landing position and missing the ILS approach. The CAT needle represents a beam that is actually a track to the runway.




**The CAT tells you** where you going as well as where you This drawing shows how the standard ILS indicator can give you ON COURSE reading of position when actually the airplane is heading out of the ILS approach. CAT indicator does not. Follow CAT needle and you're sure of ting the runway.

**Procedure:** Switch on the CAT when airplane has reached the localizer ON-COURSE beam. Thereafter, fly toward CAT needle and keep it centered until contact.

Is it proved? The CAT is approved by the CAA. In use for more than a year on scheduled service by Eastern Air Lines.

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# IN NEW CONVAIRS, TOO

Power plant section of Convair 340, one of several Convair types that use Breeze Conduit.

BREEZE MARK

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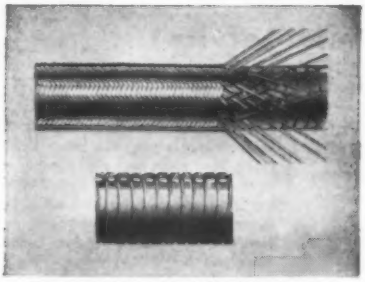

Breeze Stainless Steel Conduit, showing interlocked and braided construction.

Like so many types and makes of military and commercial aircraft, latest CONVAIRS rely on BREEZE Conduit and Fittings, particularly in the *power plant sections*. In such applications high heat resistance is a critical safety requirement, and BREEZE heat-resistant, stainless steel conduit meets the most exacting specifications in this respect. BREEZE 198 Series Conduit is FIREPROOF —withstands temperatures up to 2000° F. for 5 minutes in accordance with CAA safety regulations, Release No. 259. Breeze Conduit and Fittings for ignition circuits or high tension applications is a production item, readily available in a wide range of sizes. Flexible conduit assemblies are made to specifications for any use.

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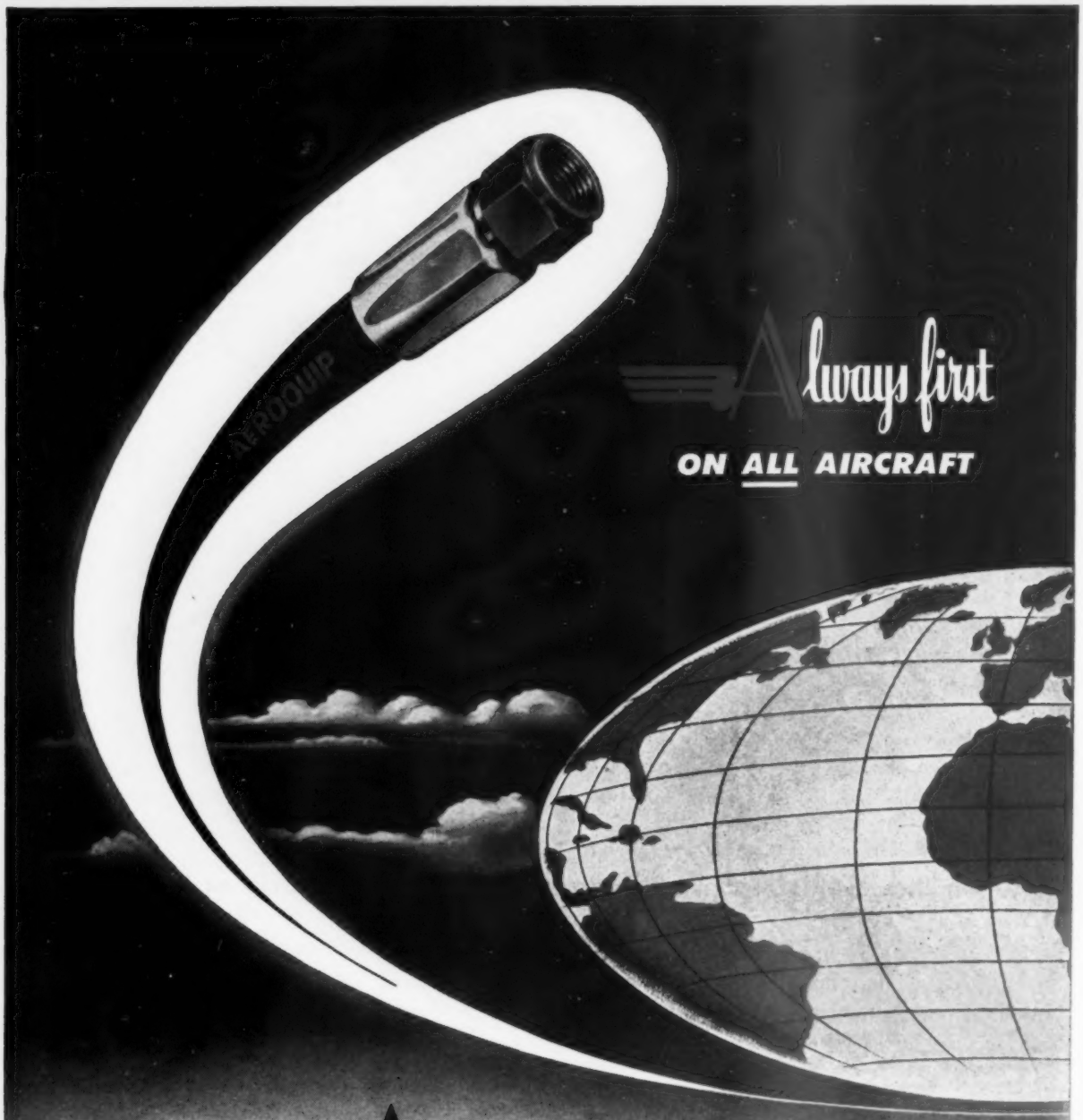


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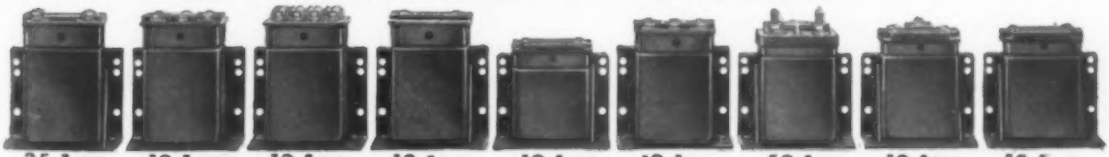
10 Amp 4 P.D.T.



25 Amp S.P.D.T. | 10 Amp 3 P.D.T. | 10 Amp 4 P.D.T. | 10 Amp S.P.D.T. | 10 Amp 2 P.D.T. | 10 Amp 3 P.D.T. | 50 Amp S.P.D.T. | 10 Amp 3 P.D.T. | 10 Amp 2 P.D.T.

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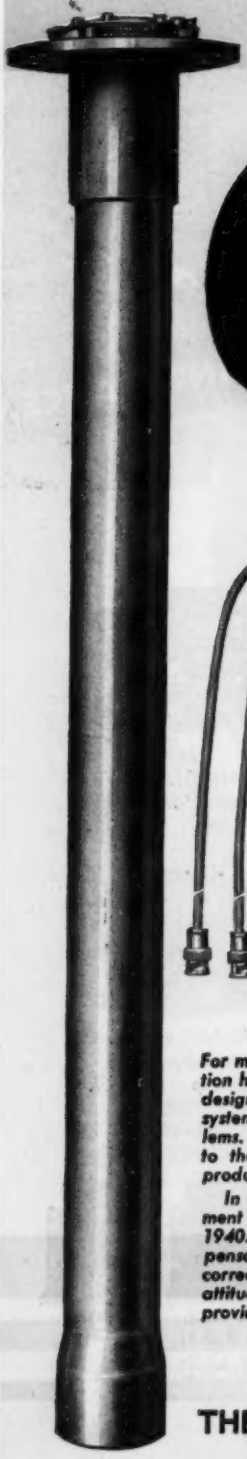
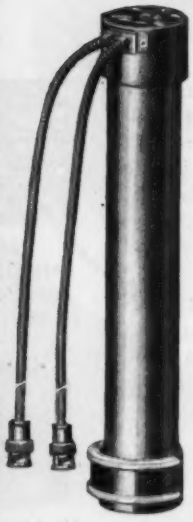
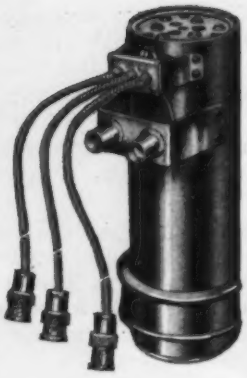
A COMPLETE LINE OF RELAYS SERVING AMERICAN INDUSTRY

# LIQUIDOMETER Gravimetric and Volumetric Liquid Measuring Systems

## *Capacitor Type*







Liquidometer capacitor type fuel quantity measuring systems feature the simplest and most fundamentally straight-forward circuits.

These systems can provide individual indication or totalizing of fuel volume or weight, low level warning, fuel transfer switching, airplane center of gravity control and other auxiliary functions.

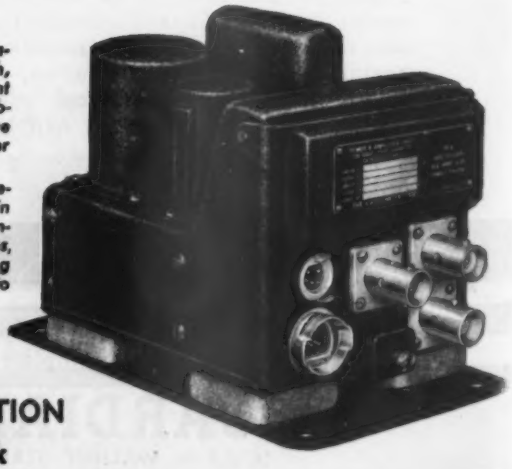
One type measures the weight of fuel based on an assumed relationship between its density and its dielectric constant. Another type is independent of fuel dielectric constant and is the only system which really gives "true" fuel weight indication. This type automatically combines the volume as measured by tank units and a dielectric reference condenser, with density as measured by a Liquidensitometer. An uncompensated type is also available.

If desired, Liquidometer fuel weight measuring systems can be arranged to provide volumetric "full' tank indication, regardless of the type fuel or its temperature. This feature is of material benefit during ground or airborne refueling operations.

Indicators, power units and tank units are rugged, compact and are of lightweight construction. They combine the features of sound progressive engineering, expert workmanship and best quality materials.

*For more than three decades The Liquidometer Corporation has concentrated almost exclusively on the research, design and manufacture of liquid quantity measurement systems and the attendant installation and service problems. This specialization has proved to be of great value to the aircraft industry which has used Liquidometer products exclusively since 1929.*

*In the capacitance method of fuel quantity measurement Liquidometer started extensive research back in 1940. It was the first to recognize such needs as compensation for fuel dielectric and density differences, correction for variations in fuel levels caused by varying attitudes of aircraft, and tank unit characterization to provide uniformly spaced indicator graduations.*



**THE LIQUIDOMETER CORPORATION**

**Long Island City 1, New York**

25th ANNIVERSARY

Experience Inspires Confidence

EASTERN AIR LINES

# Only the Beginning...

**In the 25 years** that Eastern has been in business we have carried 23,681,753 passengers. Perhaps you were one of those passengers.

I am deeply grateful as I think back to Eastern's humble beginning. In 1928 we pioneered flying the mail between New York and Atlanta, a distance of only 940 route miles. It has taken many, many years of heartache, trial and error to bring Eastern to the system it is today.

From that beginning we have expanded to 91 key cities, covering 12,746 route miles.

During the past year alone we carried 4,237,327 passengers over two billion passenger miles.

Eastern's family has grown from its original 41 members to more than 9,950, all expertly trained to serve you.

If there is one factor that has contributed to our growth, we feel it has been the dependable record and experience of our personnel and equipment together with one of the finest aircraft maintenance organizations in the world.

You can be assured Eastern's personnel is thoroughly dependable. Through the years we have made it a practice to select our personnel with great care. We have one of the most comprehensive training programs in the industry. Many of those who started with us twenty to twenty-five years ago are still with us today, holding key positions. We are proud of this record.

In the selection of our airliners we spend years in studying and testing the finest aircraft available. Time and performance have proven that our Super-Constellations, New-Type Constellations and Silver Falcons are the *most advanced* and *dependable* airliners in the world.

Dependable airliners and dependable personnel have given Eastern a world-wide reputation for Double Dependability.

To uphold this reputation, we have established the finest maintenance base in the country, equipped with the best tools money can buy. Our airplanes are periodically given complete overhaul. Every single part is serviced in minute detail to make the airplane even better than new when it emerges from our shops, ready for service.

### Looking to the Future

In this business of air transportation you must always look to the future. Ideas that were thought to be impossible yesterday may be obsolete tomorrow. Within the next ten years we will make more technical progress than we have in the past twenty-five.

Within ten years, for instance, possibly sooner, many airlines will be using jet equipment exclusively. We will then be able to fly between New York and Miami in 2-2½ hours.

For local schedule operation, I predict we will be using helicopters, capable of flying better than 200 mph.

The next big step-up in speeds after jets will probably occur within the lifetime of most of us, when, God willing, we will fly on atomic fuel, high above the stratosphere at speeds that almost defy the imagination.

I am sure that whatever is in store for air transportation, Eastern, as it has in the past, will offer you the finest, the fastest and the most dependable service that your money can buy.

Sincerely,

Eddie Rickenbacker

*President and General Manager*

# Eastern Air Lines

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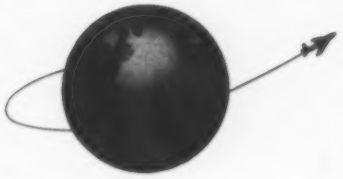

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**Confident in the influence of AMERICAN AVIATION's readers, and confident in the editorial scope and quality these readers find in our magazine's pages, these blue-ribbon advertising agencies served their clients' interests by placing 876 pages of display advertising in AMERICAN AVIATION during 1952, an increase of 174 pages over the previous year.**

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*Popular ground power unit and towing tractor—self-propelled, 600 or 1000 amperes for regulated 28.5 volt D.C. power supply*

# Leading airlines in the U.S.A. use HOBART ground power units

***Leading air lines have found the "power-pull" answers their vital requirements for aircraft ground power. Here are some of the reasons why:***

**MOBILE,** self-propelled. Same engine driving tractor transmission and generator.

**PRIGE** within operating budgets.

**CAPITAL** investment less. Saves $1000 over a tractor and separate trailer mounted generator.

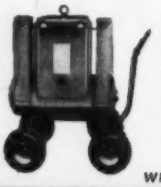
**CAPACITY**—sufficient to handle engine starting and electrical loads of the Constellation and DC-6.

**DEPENDABILITY**—time tested at airports all over the world. A minimum of maintenance can be expected with routine care

**PROTECTION**—all latest protective devices to assure safety—both to plane's electrical system and to the generator.

**UTILITY**—can be used as a towing tractor.

*OVER 100 AIR LINES AND MANUFACTURERS ARE USING MODELS FROM THIS COMPLETE LINE.*



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# Foul Weather Friend!

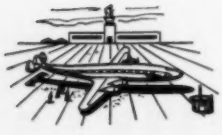
**No matter how marginal the weather, planes land safely on fields equipped with TVOR. This new let-down facility keeps your airport operating through rain, low ceilings and restrictions to visibility—extends its usefulness by 40%. TVOR provides all the security of VOR—*at less than one-fourth the cost.***

**TVOR was developed to meet the needs of small and medium-sized airports. Its single installation provides a terminal omnidirectional radio range that can be installed in an inexpensive shelter directly on the airport.**

**Any plane with standard VOR instrumentation can make *positive approaches* to a TVOR equipped field. On course indication is steady. Over the station cone is definite. Fifty watts of antenna power provides ample coverage for omnirange navigation. TVOR is built by the Maryland Electronic Manufacturing Corporation, producers of similar installations for the CAA.**

**The cost of a complete TVOR installation is less than a quarter that of VOR. Yet the components are of the same high quality and the system is given the same rugged tests!**

**Corporation, municipal and private airfields can't afford to be without the safety and convenience of this all-weather let-down facility. Installations are ready for 90 day delivery. Write or call today for further information. Or flight test and inspect the equipment at the College Park Airfield.**



**TVOR changes fair-weather to all weather airline service.**

**TVOR guides corporation aircraft safely to their home fields, in spite of low ceilings.**

**TVOR works with standard instrumentation. Private planes "home" on their own airfield.**

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One of the four divisions of United Aircraft Corporation

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## When & Where

May 11-13—IRE National Conference on Airborne Electronics, Dayton Biltmore Hotel, Dayton, Ohio.

May 14-17—9th Annual Forum, American Helicopter Society, Mayflower Hotel, Washington, D. C.

May 17—National Air Carnival (Armed Forces Day), Municipal Airport Birmingham, Ala.

May 18—National Fire Protection Assn., Aviation Seminar, Palmer House, Chicago.

May 18-22—5th National Materials Handling Exposition, Convention Hall, Philadelphia, Pa.

May 19-22—ATA Operations Conference, Park Plaza Hotel, St. Louis, Mo.

May 19-23—Aviation Writers Association, Annual Convention, Dallas-Fort Worth, Texas.

May 20-22—IAS, AIEE, ISA & IRE, joint National Telemetering Conference, Edgewater Beach Hotel, Chicago.

June 6—4th Annual Maintenance & Operations Clinic, Reading Aviation Service, Inc. Municipal Airport, Reading, Pa.

June 7-12—SAE, Summer Meeting, Ambassador & Ritz-Carlton Hotels, Atlantic City, N. J.

June 9-11—Second International Aviation Trade Show, Statler Hotel, New York.

June 17-20—ADMA Mid-Year Meeting, Chateau Lake Louise, Alberta, Canada.

June 29-July 2—ASME semi-annual meeting, Statler Hotel, Los Angeles, including Air Cargo & Heavy Press for Light Metals sessions.

July 9-12—Sixth Annual Aviation Exposition, Detroit Wayne-Major Airport, sponsored by Aero Club of Michigan.

July 15-16—The Institute of the Aeronautical Sciences' Annual Summer meeting and Honors Night Dinner, Los Angeles, Calif.

Sept. 5-7—National Aircraft Show & 50th Anniversary of Powered Flight, Dayton, Ohio.

## International

May 14-22—FAI Conference, Scheveningen, Holland.

June 16—ICAO Assembly, Brighton, England.

June 26-July 5—Int'l Aircraft Engineering Convention, Paris; and Int'l Aircraft Show, Le Bourget Airport, Paris, sponsored by French Aircraft Industries Association.

[illegible] 25—ICAO, Legal Committee, Rio de Janeiro.

[illegible] 7-13—SBAC Aircraft Show & Flying Display, Farnborough, England.

[illegible] 7-18—IAS-RAes, Fourth International Conference, London, England.

[illegible] 10—International Air Race, England to Christchurch, New Zealand.

[illegible] 1-22—IATA, Traffic Conferences, Honolulu.


# No Time to Chat!

**"SCRAMBLE! PILOTS, MAN YOUR PLANES."**

Chit-chat comes to a sudden stop as pilots pour out of the ready room and race to their waiting planes. Seconds later they are in the air. Whatever their mission, they're on the job . . . in a hurry!

The story of their triumphs begins with the skills and craftsmanship of those who make the components for their planes. Jet components must be right — fabricated precisely as designed. Leading aircraft producers know they can count on Lavelle to do just that!

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**Since 1923, the Belgian flag has been in the skies on the main commercial air routes of the world.**

**Sixty commercial aircraft, all but four of which are of American manufacture, now make up SABENA's fleet, reaching the 75 principal cities of Europe, the Near East, the Belgian Congo and South Africa.**

**The finest commercial aircraft maintenance shops in all Europe (at Melsbroeck Airport, Brussels), certified by the CAA and under the supervision of meticulously-thorough Belgian technicians, assure the utmost in operating efficiency and dependability of every Belgian flag carrier.**

**SABENA is proud of the part it has played, and is playing, in the development of the great global air transport industry.**

SABENA

*the world airline with the extra margin of experience*

SABENA BELGIAN AIRLINES

**SABENA Building, 422 Madison Ave., New York 17**

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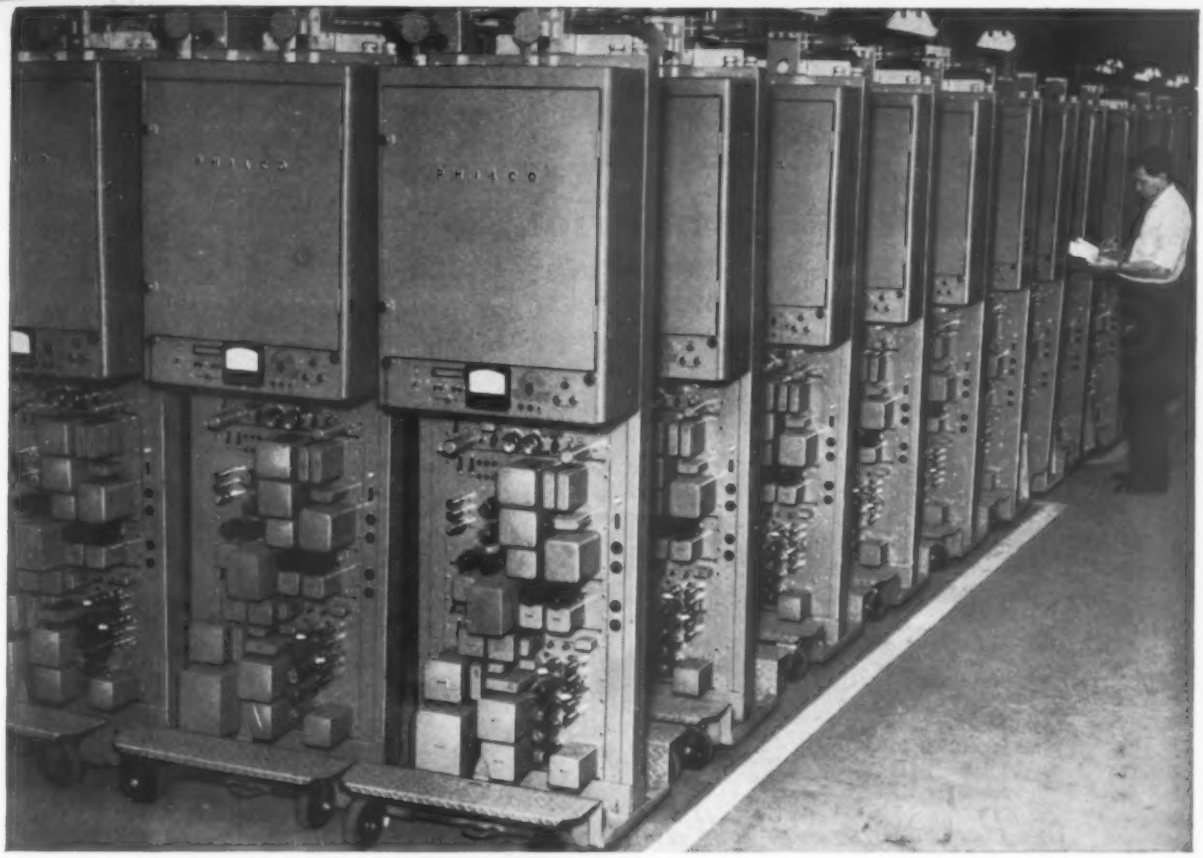


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Philco microwave components meet most JAN (Joint Army-Navy) specifications without any changes in circuitry, thereby permitting other users of microwave communications equipment to have the built-in reliability required by the Armed Forces. That is why commercial users of Philco microwave equipment include such famous names as American Telephone & Telegraph Co., Santa Fe Railway System, Bonneville Power Administration, Platte Pipeline Company and many others.

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EXECUTIVE AIRCRAFT OVERHAUL

BY

TEMCO

CASE HISTORY: #811-117
CUSTOMER: AMERICAN FLYERS AIRLINE CORPORATION
SHIP: DC-3 N-33656

Precision overhaul at TEMCO-Greenville included 4000 hour inspection on outer wings; replacement of center section wing doubler and attach angle. Installation of Douglas air step kit to existing cargo door. Bolts replaced on attach angle with torque wrench to assure even tension under flight conditions. Same operation also applied to American Flyers DC-3 N-19922 (Case History #811-120):

**Owners of multi-engine executive aircraft may now look to TEMCO-Greenville for one of the most comprehensive overhaul-modification services in the nation. Formerly available only to government agencies and to the airlines, TEMCO-Greenville's modern production-line facilities offer a unique rehabilitation service backed by a reputation for producing *faster, better and at lower cost.***

For full details on this case history and information about TEMCO's complete custom rehabilitation service for multi-engine aircraft, write on business letterhead to:

Herrol Bellomy, Gen. Supt., TEMCO Aircraft Corporation, Greenville Overhaul Division, P. O. Box 1056, Greenville, Texas.

TEMCO
AIRCRAFT CORPORATION
DALLAS, TEXAS

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This familiar scene might be any one of several hundred airports across the country. It has become a part of Scheduled Airline flying—so much so that passengers instantly recognize that *here* they can buy *the standard* Airline Trip Insurance. This means more sales and results in *more money for you!*

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STAR performers!

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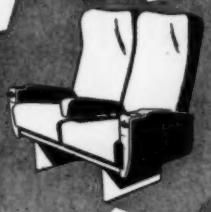

★ TECO MODEL 316 . . . Luxury passenger seat for Trans-Canada Airlines, Canada and Civil Air Transport, Formosa.

★ TECO MODEL 317 . . . Deluxe passenger seat for Eastern Airlines Super Constellation service.

★ TECO MODEL 332 . . . Upholstered crew seat for light executive aircraft—standard equipment in twin-engine Aero Commander.

Now your specific passenger seating problems now. Every request for information is given prompt, individual attention and an early reply. Send all inquiries to: 2501 No. Ontario Street, Burbank, California.

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# Industry Spotlight

A 50-WATT TVOR station is being installed at Fairfax Airport, Kansas City, Kansas, by Wilcox Electric Company, Inc., for evaluation by airlines, corporate aircraft, and others operating in that area. The Wilcox terminal omni, which sells for under $10,000, is also available in a 200-watt version, such as that now being used by Pan American at Roberts Field, Liberia. Belgium government has also ordered Wilcox TVOR's. Wilcox is located at 14th and Chestnut St., Kansas City 1, Mo.

•

**CAA is taking part in the Navy's 150-hour type test on the Boeing 502 geared gas turbine engine. Present plans call for CAA accepting the military run as the core of CAA type certification tests, with possibly another 10 hours of testing required to meet specific civil requirements.**

•

Navy's version of the North American T-28B advanced single-engine trainer, which made its first test flight early this month, has substantially better performance than the Air Force's T-28A. Powered by a 1425 horsepower Wright R-1820 engine, the T-28B has a top speed of 346 miles per hour, compared with 283 for the USAF version. Service ceiling has been extended from 25,600 to 35,500 feet and rate of climb from 2,080 feet per minute to 3,850 fpm.

•

**Tentative flight date for the prototype Douglas DC-7 is set for the first week in May, with engine run-in on the Wright Turbo-Compound powerplants scheduled before the end of this month. Wing and fuselage joining of second DC-7 recently took place, and the number three airplane is coming along fast. All three ships may be used in CAA certification tests. American is scheduled to take delivery on 15 DC-7's this year.**

•

The Convair XF2Y-1, the jet-powered, water-based fighter which may introduce a revolution in fighter concepts, made a successful first flight at Consolidated Vultee's San Diego plant earlier this month. Piloted by Sam Shannon, the XF2Y-1, which is the first plane to be built to take hydro-skis, stayed aloft less than a half hour on its first hop.

•

**Type certification tests on McCauley Industrial Corp.'s new Met-L-Matic constant speed propeller are scheduled to start any day now. First in a family of constant speed propellers in the 145-horsepower to 350-horsepower range planned by McCauley (Dayton, O.), the one which recently made its initial flight test was for a Cessna 180 and was a simple constant speed unit. Other models will feature in-flight feathering and reverse pitch.**

•

First Boeing B-47 jet bomber to be completely built at Lockheed Aircraft Corp.'s Marietta, Ga., plant was rolled out recently. Lockheed had completed B-47's some time ago, but largely with parts manufactured by others.

•

**Substitution of Atar 101D turbojet engines in the French SO 4050 Vautour attack plane is expected to boost its present top speed of about 685 miles per hour to Mach 1 in level flight.**

•

Jet drones used in the Atomic Energy Commission's exploratory work at the Nevada Proving Grounds are Lockheed QF-80's, pilotless versions of the F-80 Shooting Star, incorporating Sperry's robot system. Planes fly through radio-active clouds formed by explosion of nuclear weapons.

# Watch Out for "Cost per Ton-Mile"...

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"Cost per ton-mile" is what military planners watch in everything that concerns air transport to our Armed Forces. And rightly! But let's be careful what we mean by "ton-mile cost." It's got to be *loaded* cost.

Men can march on and off *any* plane. The big problem is equipment . . . tanks, trucks, bulldozers, massive pieces. Operating cost for such shipments *must* include loading and unloading . . . with all the attendant factors. If equipment has to be knocked down and crated, then uncrated and reassembled at destination . . . that's cost. Man-hours for handling, expensive machinery for carting, hoisting, stowing . . . that's cost. And longer turnaround time for these cumbersome operations is also cost . . . idle aircraft eating up dollars.

Reckoned completely, with all these factors, ton-mile cost for the Fairchild Packet C-119 is the lowest ever achieved in air history! Tanks and trucks roll up its ramp as easily as men march in. Bulk cargo goes "as is." Turnaround time is the fastest ever. And in addition, this rugged "Flying Boxcar" is the most versatile in air transport. No other aircraft has remotely approached its successful score for air drops of men and materiel . . . 10 tons dropped from a single C-119!

No other aircraft can match its record for "dirty jobs" done triumphantly . . . short-haul and long-haul, from the Berlin airlift to Korean mountains.

To military men all over the world, the TWIN BOOM of the Fairchild Packet means "big stuff" ready to land . . . tons of bulky supplies or squads of troops ready to pour down the ramp and go into action at the lowest total cost in money and time. That's lowest *total* cost . . . *ton-mile cost loaded, and unloaded.*

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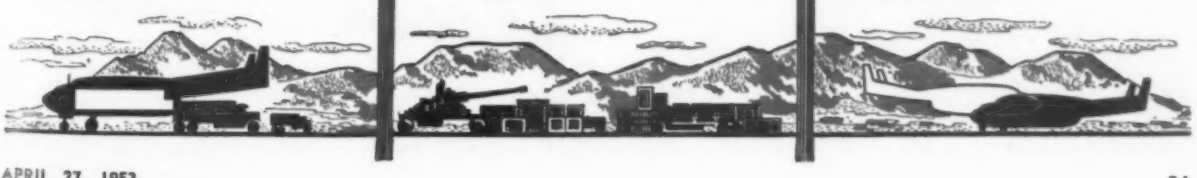

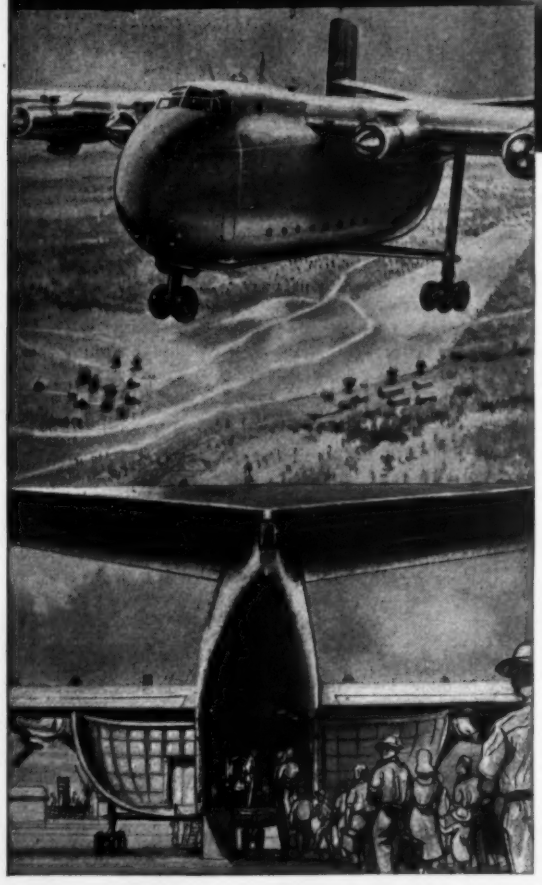

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Beef entering warehouse? No, these carcasses are being loaded into the hold of the Universal, an aircraft which offers a freight capacity of six thousand cubic feet and a payload of twenty-two tons—a combination which would be ideally suited for an operation such as the now famous Beef lift in Australia. The carriage of chilled meat by air from the pasture-side abattoir to the dock-side or railhead eliminates costly droving of live cattle over long distances. A return load of personnel, stores and equipment would be an obvious economy made possible by an operation of this type with the

*Universal*

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# West Coast Talk

**By Fred S. Hunter**

IT MIGHT be worth mentioning in passing—in the light of recent lightweight superiority fighter discussions—that the F-86 Sabre is at least an improved aircraft nowadays. The F-86F, now facing the MIG's in Korea, still has an electric motor to open the canopy—just in case a pilot might have occasion to get out of there while traveling at high speed. It also still has a secondary landing gear extension system—on the theory that an airplane continuing to be operational is more useful in a war than one laid up for major repair job from a belly landing. It has, in fact, all of the safety devices originally incorporated in the original F-86A.

Its J47-GE-27 engine, however, has substantially more thrust than the former -13's of the F-86A's, and it climbs and flies faster. With power controls, it maneuvers better. Through elimination of the semi-automatic leading edge wing slats, it can make tighter turns. Penalty here is an increase in the landing speed from 110 to 130 mph, but pilots have found this poses no great strain. And finally, there is the improved General Electric APG-30 gunsight, which is proving to be a most formidable accessory when given the proper attention and care. In all, it looks like the F-86's will keep right on giving a pretty good account of themselves in Korea or anyplace else.

## ZERO GRAVITY

Maj. Charles E. Yeager, who should know, reports that it is possible to maintain zero gravity for 30 to 35 seconds in an F-86—or even the slower T-33—by flying a parabolic curve from a fast climb to a quick dive. The floating sensation that results is baffling at first, he says, but after nine or 10 flights you get used to it and even can coordinate on the controls. Latter comment makes it look as though the boys up at the Air Force Flight Test Center at Edwards might be getting in a little practice for the eventual coming of weightless flight out in the reaches of space.

## WEST COAST MISCELLANY

Air Force has given the Los Angeles architectural firm of **Pereira & Luckman** a contract to prepare a **master text book on airport planning and design** for the USAF to follow henceforth. Came as a result of their production of master plans for the jet test center at Palmdale, Calif., and the guided missile test center at Banana River in Florida . . . Rohr Aircraft expects to **pass its World War II** peak of 9,800 employes in July or August . . . **Doug Kelly,** who is in the Constellation planning section, is the new president of the Lockheed Management Club at Burbank, which is the biggest in the industry . . . One Los Angeles sub-contractor has cut from a 53- to a 46-hour work week, but another one is up to 58 hours, which indicates **the overtime problem isn't resolved yet** . . . Lockheed has asked for two more **one-year options** on the facilities it leases from the Los Angeles Department of Airports at the San Fernando Valley Airport, where its jet flight line is located . . . William R. Whittaker Co., which does a bit of speculating in oil on the side, is set to drill **a new wildcat up in Merced County** . . . Douglas has decided to write off possible use of **afterburners on the DC-8** because of the noise element . . . Marquardt is now selling **ramjets off the shelf** as auxiliary power units for missiles . . . Institute of the **Aeronautical Sciences building** in San Diego has been redecorated and reopened to public use following two years of occupancy by Convair . . . Average airline **pilot's bag now weighs approximately 65 pounds,** showing how regulation keeps mounting in the industry . . . North American Aviation shipped its **first F-86H** up to the Air Force Flight Test Center at Edwards to await arrival of the J-73 engine there . . . Convair's XF2Y-1 delta-wing, seaplane fighter now whisks around San Diego Bay dressed up in a **camouflage paint job** . . . Rohr is scheduled to start production on **power packages** for the **B-52** shortly. Rohr also will build **aft fuselage sections** for the B-52 . . .


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# Air Transport Appraisal: 1952

THE YEAR 1952 was a good one for world air transport.

It was neither as good in some respects nor as bad in others as the forecasters had said it would be.

by W. W. P.

It was another year about which it could be said that more airplanes flew more people to more places than ever before.

The same could be said for cargo and mail.

This healthy continued business increase tended to shade some of air transport's more pressing fundamental problems, of which financial stability is perhaps most notable.

Among the year's highlights were:

• **The pattern was set** for the adoption during 1953 of low-fare high-density-seating tourist service as the standard air service for much of the world. Concurrent with this trend, the former standard service becomes first class or de luxe with limited frequencies.

• **The British introduced** high-altitude, high-speed, turbojet transport service to South Africa and the Far East, touching off both a new competitive factor in world air transport and international debates among manufacturers and operators on the subject of jet equipment. U.S. and many European operators continued to order and take delivery of new piston-engine aircraft.

• **In the United States** the scheduled airlines established a new and noteworthy safety record.

• **Throughout the world** the carriers continued to offset higher operating costs by high-density seating configurations, consolidations, and mergers, combined with a continued high traffic volume.

• **Airports, ramp servicing,** baggage handling, and passenger service continued to receive major attention, but with only moderate successes in solving a multitude of problems.

• **Private airlines** under government regulation continued to strive for greater financial stability but with only modest success. Continued heavy traffic tended to lull government regulatory agencies into ignoring fundamental financial weaknesses which need curing if carriers are to weather future economic storms and re-equip fleets with jet or turboprop.

• **Turbojet** received the predominant attention during 1952, but toward the end of the year there were sights that turboprop power would begin overtaking pure jets as the preferred future power for the greatest use on the majority of air routes.

ALTHOUGH every surface index pointed to 1952 as a year of impressive gains, the airline industry as a whole was a long way from achieving its financial goals. Ralph Damon, president of Trans World Airlines, summarized the problem succinctly in his recent Kansas City speech in which he said:

"We have achieved the status of a billion-dollar industry; we have acquired a dignity undreamed of in barn-storming days; but we have not yet won full financial stability.

"This past year new records were established in all phases of the industry—passenger traffic, cargo, and mail. But these same figures have not been translated into a correspondingly high level of earnings.

"Our business is subject to violent traffic fluctuations, rapid technological developments, and long time-lags in the production of new equipment. These factors place special capital demands on the business. The prime need of the industry for the next few years is a level of earnings which will attract long-term capital, and a regulatory policy which will permit such earnings."

Regulatory agencies of all governments, including the Civil Aeronautics Board of the United States, might well ponder these remarks of Mr. Damon, for they hit at the most fundamental of all problems which have harassed the scheduled airlines of the world from the beginning of operations.

A high level of earnings is not the only problem facing world air transport, however. The machinery of the International Air Transport Association is again being strained by low fares offered this year by Loftleidir, the Icelandic airline, over the North Atlantic.

Nationalistic aspirations and fears of various countries continue to plague and block international carriers in many areas of the world. Safety requires more attention than it is receiving in many countries. Airport problems are rife. Costs continue to rise. But as long as traffic continues to increase the status of world air transport must be deemed healthy. At least for 1952 no other conclusion can be reached.

. . . WAYNE W. PARRISH

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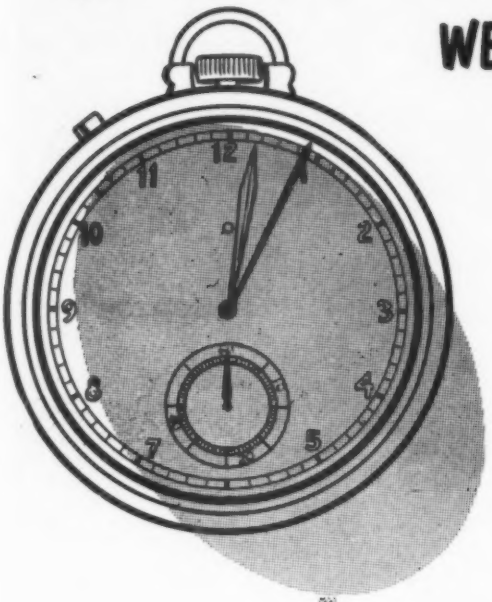

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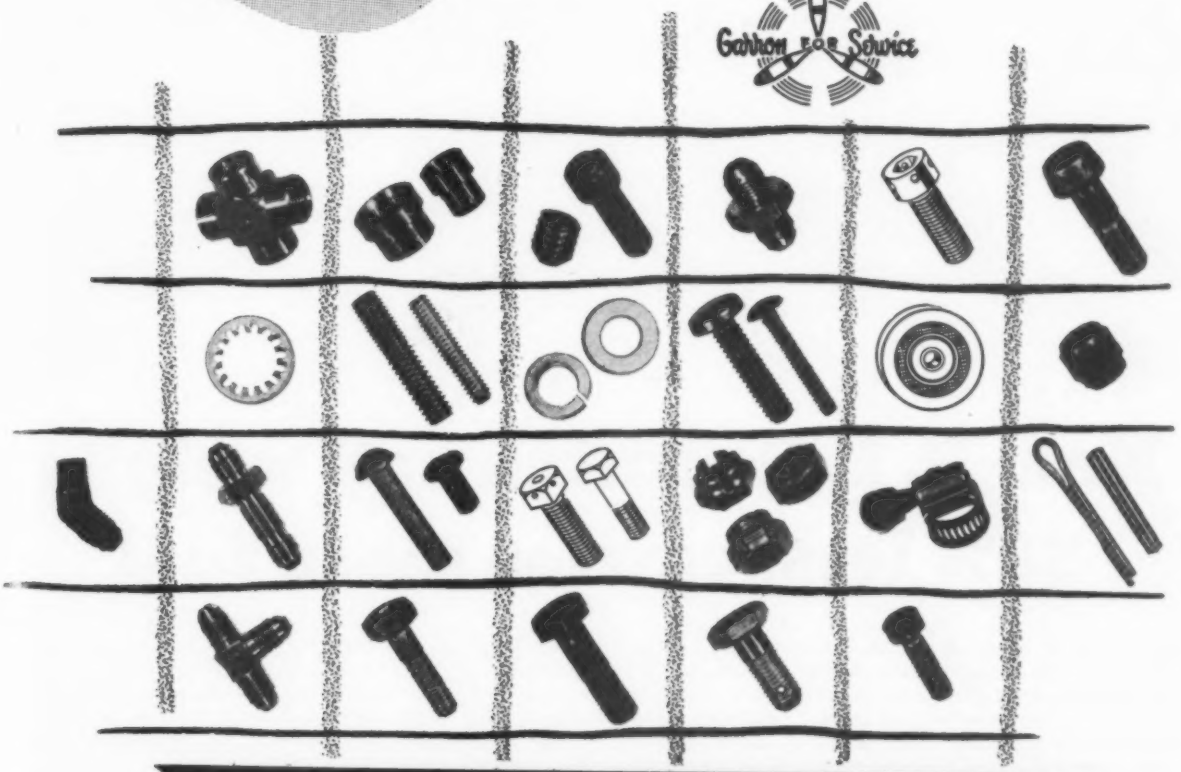

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NO SOONER is one model of the Thunderjet in production than designers start again on their perpetual job: shave every possible ounce of weight—make room for more armaments. Save every possible cubic inch inside for fuel—make way for longer flight range.

Republic engineers figured they could carry more fuel if they could use *all* the space in the wings . . . including odd-shaped corners and crevices. But this would add weight, and it looked as though the tricky shapes couldn't be built anyway.

They brought this dual problem to B. F. Goodrich. Here, engineers tackled the assignment three ways. A thinner wall was developed that would still seal as well under gunfire. A way was found for building shapes that would fill out the odd corners, carry more fuel. And finally, a lighter fitting was worked out that saved still more weight.

It all added up to more gallons of fuel and 38% less weight than cells in the early Thunderjets. The new B. F. Goodrich cells have been proved on the famous F-84G, will soon be seeing duty on the new F-84F and RF-84F.

The development of the lighter weight fuel cells is another example of BFG leadership in rubber research and engineering on the problems of aviation. Other B. F. Goodrich products for aviation include tires, wheels and brakes; heated rubber, De-Icers; Avtrim; Plastilock adhesives; Pressure-Sealing Zippers; inflatable seals; Rivnuts; accessories. *The B. F. Goodrich Company, Aeronautical Division, Akron, Ohio.*

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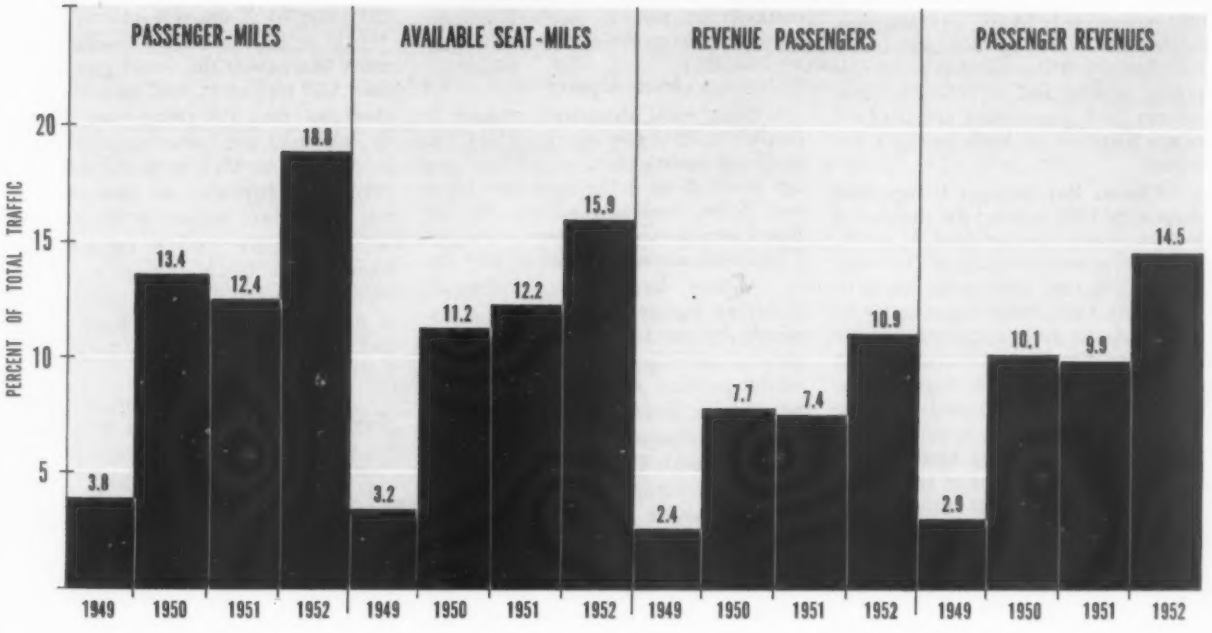
American Aviation

VOLUME 16, NUMBER 24

## Percentage of Coach to Total Passenger Figures

### Domestic Trunk Carriers




# Air Transport at the Mid-Century Mark

**Airlines caught between demands for lower fares, rising costs, and jet aircraft financing.**

*By* William V. Henzey

DESPITE a half-century of unparalled development and progress, aviation today presents as mystifying and stimulating a challenge to American enterprise and ingenuity as it did to Wilbur and Orville Wright in 1903.

While two men and a machine made aviation history at that early date, vast corporations, thousands of machines, hundreds of thousands of men, and billions of dollars necessary for "Aviation —1953" clearly indicates that the similarity of the two periods is less practical than notional.

Aviation has grown into big business. Last year, for example, U. S. certificated airlines alone grossed $1,130,787,9[illegible] in commercial operating revenues, transported 30 million passengers, employed over 100,000 persons, operated 1,522 airplanes, and compiled the greatest safety record in air history to date.

But with high costs eating up a major portion of incoming revenue, aviation men are apprehensive of the future with its bold demand for jet transport planes and the staggering requirements of over one billion dollars in the next few years to finance needed equipment, including such a jet fleet.

The airline industry thus entered this 50th year of powered flight in much the same state as the average individual American citizen. It was grossing more money than ever before, its expenses were catching up with its intake, and it viewed the future with apparently justifiable concern.

But unlike the citizen, free within his economic boundaries, the airlines, regulated directly by the Federal Government and indirectly by the American investor, faced a compulsory period of expansion reaching far beyond the period within which economic experts predict a general business recession.

One of the great corporations to grow out of aviation's first fifty years—American Airlines—summed it up this way recently before the Civil Aeronautics Board: Almost $300 million worth of new aircraft and parts are needed this year. Between $700 million and $900 million will be needed to meet the growing demands for jet transports, perhaps within the next five years.

Assuming that there is no recession and current trends continue, American said, about $250 million can be raised by the industry through depreciation accruals, special funds, and retained

earnings. Needed from other sources: about $700 million just for aircraft now on order and a potential jet fleet.

It was with this in mind that the U. S. airline executive looked apprehensive despite phenomenal traffic and financial records of past few years. His problem, simply stated, was to continue and to improve on the progress of the present to ensure future success.

He faced this problem with these significant developments in mind:

• **A Steady Trend Toward Mass Travel.** Coach or tourist-type traffic, once only a fraction of total airline traffic, in 1952 constituted 18.8% of total passenger-miles flown by domestic trunklines, could well increase that percentage to 30% in 1953, and, according to many industry and government officials, will surpass first-class air traffic in just a few years.

• **Fewer But Stronger Competitors.** Mergers in 1952 reduced the number of domestic trunk carriers from 16 to 14. A further reduction to 12 is likely this year, with Braniff (after acquiring Mid-Continent), Delta (after acquiring C&S), Western (after fully acquiring Inland), and either Eastern or National (after acquiring Colonial) seen as strengthening the trunk industry—and intensifying competition.

• **Less Federal Aid; More Federal Interference.** All but four of the present 14 trunk carriers are free from subsidy; most are on so-called "final" mail rates. But the economic hold exercised by CAB when industry was on "temporary" rates is now transferred to carriers' fare structure. Big issue: "What is a proper rate of return for airlines?"

• **Jets On the Horizon.** With British Overseas Airways Corporation leading the way, airlines, mostly foreign, have purchased 56 of de Havilland Aircraft's Comet jet transports. At least another hundred are in the serious talking stage. BOAC is operating jet schedules. Canadian Pacific, Air France, Lineas Aeropostal Venezolana, Japan Air Lines, Panair do Brasil, and Pan American World Airways have contracted for Comets. American manufacturers are not rushing, but are not idle—hope to enter the field soon.

Thus, the broad outlook for the airline industry generally. But unlike only a decade ago when reference to the "airline industry" covered about 20 companies in two or three different categories, today there are numerous types and classes of direct and indirect air carriers: all part of the airline industry and all with problems peculiar to their individual types of service.

Here is how these many products of the Wright Brothers' first flight look on an individual basis in this Golden Anniversary year:

• **Domestic Trunk Lines.** Cost trend one of two most disturbing elements. Revenues in 1952 were up $100 million, but net operating income was down over five million, as operating costs spiralled from $558 million in 1951 to $672 million last year.

All but Chicago & Southern, Colonial, Continental, and Northeast were free of subsidy, according to CAB's subsidy separation formula. Mergers involving C&S and Colonial to reduce subsidy trunk lines to two. Next year, out of over $40 million in mail pay to trunks, less than three million is earmarked for subsidy, with remainder considered payment for services rendered.

## Fare Upset?

Other most disturbing element is possible upset of fare structures by CAB. A Board investigation, started one year ago when all trunk-line fares were hiked one dollar, indicates concern by the Board over possible "excessive earnings." This could mean an enforced fare cut.

Airlines want the case dropped, may even increase fares this year if permitted by the Government. They feel present earnings (1) are inflated by world political situation and (2) are necessary to insure against need for Government assistance in future years.

• **Domestic Local Service Lines.** Big problem is equipment. Most now operating Douglas DC-3's, hoping for a suitable "feeder-type" replacement soon. One merger and termination of two local carriers' certificates lowered the number of such carriers to 15 in 1952. Two pending merger cases and a possible certificate termination could lower that number to 12 this year.

Industry was heartened last year when CAB revised previous policy, gave two of most successful lines—Piedmont and Mohawk—seven-year renewals, as contrasted with three- and five-year renewals under old policy. Subsidy was still heavy, however, in 1952, despite marked gains toward self-sufficiency by some lines.

Mail payments to the industry in 1952 totalled $21,334,962, or $3.5 million more than in previous year. Total operating revenues were up over seven million to $42,519,676, but this was offset by similar gain in operating expenses, which were also up seven million to $43,472,724.

Frontier, Ozark, Piedmont, Trans-Texas, and Wiggins showed profits for 1952. But industry as a whole showed net operating loss of $953,048.

• **International Airlines.** Most important developments in this field were start of large-scale coach or tourist services across the Atlantic on May 1, 1952, and inauguration of jet transport services by BOAC. Most serious problems—rising costs and, to some of the U. S. carriers, absence of final mail rates which, under CAB policy, means no return on investment until final rates are established.

In the trans-Atlantic field, total passengers carried by 11 certificated lines, including two U. S. carriers, jumped from 328,764 in 1951 to 430,585 last year. Tourist or coach-type passengers numbered 187,347 in 1952, although the low-fare service was only available for seven months of the year.

U. S. lines operating international routes throughout the world grossed almost $312 million in total operating revenues last year, but rising costs shrunk the industry's net operating profit from $17 million in 1951 to $8.8 million in 1952. Mail payments to these carriers was down three million to $51,376,305.

Outlook for 1953 is expansion of trans-Atlantic coach services to points beyond European gateways; enlargement of tourist operations in the Pacific area; and eventual expansion on a world-wide basis.

In the cargo field, a rate war may develop, with Pan American threatening to break with the International Air Transport Association if its plan for a cut in volume rates is not adopted by IATA members in the trans-Atlantic field.

• **All-Cargo Carriers.** Biggest developments include (1) proposed merger of The Flying Tiger Line and Slick Airways; (2) certification of the first international all-cargo line, Aerovias Sud Americana; (3) bids of six American companies for trans-Atlantic certificate rights.

Excluding military contract operations, the three domestic freight carriers, Slick, Flying Tigers, and U. S. Airlines, accounted for less than half of the 221 million ton-miles of domestic airfreight during 1952, with combination passenger and freight lines accounting for an estimated 54%. In 1951, the two groups evenly divided the traffic.

Riddle Airlines, the only U. S. "overseas" all-cargo line, operating between the U. S. and Puerto Rico, handled 10 million ton-miles of freight. Aerovias Sud, operating between the U. S. and Central American points, had not completed its first year of operations at press-time, but reports traffic is "good," and could use more equipment.

In the trans-Atlantic field, although it turned down certificate bids of three lines last year, CAB is again conducting hearings for similar certificates with Sea-

## 1952 Domestic Air Coach Results

| | Passengers | | Passenger-Miles (000 omitted) | | Available Coach Seat-Miles (000 omitted) | | Revenue—1952 | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1952 | 1951 | 1952 | 1951 | 1952 | 1951 | Passenger | Cargo (1) | Total |
| American ..... | 233,416 | 102,133 | 377,671 | 178,569 | 428,334 | 206,087 | $15,676,480 | $415,473 | $16,091,953 |
| Capital ..... | 237,385 | 217,909 | 116,480 | 109,641 | 194,499 | 174,267 | 4,972,685 | 580,694 | 5,553,379 |
| Colonial (2) .. | 8,135 | ..... | 2,352 | ..... | 4,137 | ..... | 101,294 | 1,595 | 102,889 |
| Delta ..... | 80,366 | 56,225 | 70,056 | 47,560 | 97,478 | 69,620 | 2,933,524 | 127,404 | 3,060,928 |
| Eastern (3) ... | 470,155 | 357,208 | 387,960 | 294,734 | 434,304 | 404,260 | 17,654,112 | 636,960 | 18,291,072 |
| National ..... | 197,134 | 102,253 | 179,956 | 97,109 | 252 585 | 147,897 | 7,177,818 | 400,193 | 7,578,011 |
| Northwest ..... | 223,001 | 99,277 | 211,211 | 111,355 | 307,230 | 141,356 | 10.206,863 | 436,660 | 10,643,523 |
| TWA ..... | 383,124 | 186,493 | 582,494 | 253,809 | 700.707 | 324,721 | 23,736,013 | 394,973 | 24,130,986 |
| United ..... | 349,847 | 222,100 | 271,208 | 105,633 | 355,049 | 142,604 | 10,804,623 | 425,696 | 11,230,319 |
| Western ..... | 234,695 | 174,906 | 104,398 | 73,922 | 145,620 | 97,303 | 4,090,029 | 172,410 | 4,262,439 |
| | 2,417,258 | 1,518,504 | 2,303,786 | 1,272,332 | 2,919,943 | 1,708,115 | 97,353,441 | 3,592,058 | 100,945,499 |

*Source: CAB Reports*

*(1) Cargo revenue shown is that derived from cargo transported on coach flights only.*
*(2) Colonial Airlines inaugurated coach services on September 28, 1952.*
*(3) Totals for Eastern include actual reported figures for first 11 months of 1952, and projected figures for December, 1952.*

board & Western, Transocean, Flying Tiger, Overseas National, European American, and Trans-Caribbean doing the bidding.

The reopened hearings, ordered on arguments that the U. S. was losing its position to foreign carriers in the foreign cargo market, were being conducted during March and April this year in the face of increased activity in the field by the two U. S. certificated lines—Pan American and TWA. Also, in the face of a recent British authorization to one of its independent lines, Airwork, Ltd., to operate a trans-Atlantic cargo service.

• **Large Irregular Air Carriers.** Biggest source of revenue in 1952 was military contract business, although many of approximately 60 remaining carriers were still active in commercial markets. Most important pending developments are (1) outcome of CAB's Large Irregular Air Carrier Investigation and (2) proposed merger of two large associations—Aircoach Transport Association and Independent Military Air Transport Association.

ACTA reports its total 1952 revenue from so-called CAM movements, or military contract flights, was $6.8 million; IMATA reports $6.5 million. With experts predicting a continuing of the business for at least a year after any cease-fire in Korea, progress of these carriers is expected to continue indefinitely.

CAB, wrapped up in its over-all investigation of the industry, which is scheduled to take from two to three more years to complete, appears under fire on the large irregular question from the new Senate Small Business Committee under Republican chairman Edward J. Thye, Senator from Minnesota, than it was originally under the same Committee when it was headed by Alabama's Democratic Senator John J. Sparkman.

Only significant changes in the industry involve the elimination of certain carriers for "wilful and flagrant violations of the Act."

Industry largely is using C-46 and DC-4 equipment, although one group, the so-called "North American combine" has announced plans for new DC-6B aircraft.

• **U. S. Helicopter Carriers.** Biggest problem is equipment. Current three certificated lines have been authorized or promised authorizations to conduct passenger operations. Present equipment not suited to economic passenger service, so operations largely are limited to carriage of mail.

In 1952, the three lines—Helicopter Air Service in Chicago, Los Angeles Air Service in Los Angeles, and New York Airways in New York, had total operating revenues of $1,042,794, of which $1,033,430 constituted mail payments. HAS showed an operating profit of $85,926; LAA showed an operating loss of $18,123; and NYA, which just started service in the fall of '52, showed an operating loss of $69,834.

Profit figures for helicopter lines, however, are misleading, due to retroactive adjustments in temporary mail pay by CAB.

As far as equipment is concerned, LAA has two Sikorsky S-55's and a third on order. NYA operates three S-55's and has four S-55's on order, with deliveries expected June through October. HAS operates Bell 47-D equipment. The S-55 indicates the trend to rotary-wing craft with passenger potentialities. It has from six to eight places. The S-51, formerly operated by LAA had two to three places.

Meanwhile over 30 applicants want CAB to award additional helicopter certificates to virtually every large city and area in the country. Big decision awaited now is policy one—should new companies or present operators of fixed-wing planes operate helicopter routes?

• **U. S. Air Taxi Operators.** Once known as "small irregular air carriers," now officially designated by CAB as "air taxi operators." Over 2,000 small operators fit the CAB definition, but estimates are that half that number are actively engaged in offering air service.

Big problems are rising costs and "how to standardize fares." Industry wants Government to drop the 15% Federal Transportation Tax for taxi flights with less than 10 people; has come up with new zone fares, subject to CAB approval; and needs an economical twin-engine plane equipped for all-weather flying.

• **Air Freight Forwarders.** Licensed as "indirect air carriers" by CAB, this segment of the industry is plagued by two things: (1) lack of sufficient interest on part of direct air carriers in developing consolidated freight shipment business furnished by forwarders; and (2) operations of forwarder-type organizations operating outside scope of CAB's regulatory powers.

These are the up-to-date complexities of the vast network which sprang up in the 50 years after man made his first flight. They are troublesome—yet challenging. They reflect the problems and globe-shrinking activities of the machine which first made history by flying 852 feet in 59 seconds. • • •

# Mergers Forge Stronger Lines

FEWER but larger airlines was the keynote of commercial aviation in 1952 as a wave of mergers reduced the number of domestic trunk carriers from 16 to 14 and paved the way for a further reduction in 1953.

At least two more trunk carriers could cease to exist as individual concerns this year. Also one all-cargo line and at least one local service carrier appear destined to disappear—all as the result of current merger deals.

Gone from the scene following mergers last year are Mid-Continent Airlines, which merged into Braniff Airways, and Inland Air Lines, which finally was absorbed completely by Western Air Lines. As this issue went to press, stockholders of Delta Air Lines and Chicago & Southern Air Lines were about to vote on a merger agreement already sanctioned by the Civil Aeronautics Board. Officials looked for C&S to be merged into Delta by about May 1.

Well along in CAB procedural steps also is a case which would merge Colonial Airlines into either Eastern Air Lines, under an agreement between the two carriers, or into National Airlines, as the result of a CAB investigation.

Thus the Delta-C&S deal and the Colonial case could reduce the number of domestic trunk carriers to 12 by year's end.

Not active at the present time, but still on the official files at CAB, are a Delta-Northeast Airlines merger agreement and the complex New England-Southern States Merger Case in which possible transfer of some of Capital Airlines' routes to another carrier is involved. When the Capital-Northwest merger boat capsized last year in a storm of stockholders' opposition, the possible transfer of CAP's southern routes was relegated to the background by CAB.

In the local service field one merger was completed in 1952 in which Empire Air Lines became part of West Coast Airlines. Another is likely this year, under which Lake Central Airlines would be merged into another airline or be taken over by a complete new management.

CAB is now weighing the Lake Central situation. An agreement is pending under which North Central Airlines (formerly Wisconsin-Central) would acquire LCA. Also in the market are Ozark Air Lines and a new corporation known as Transport Airgroup, Inc.

Also pending before CAB and slated for action this fall is an investigation of a possible merger between Bonanza Air Lines and Southwest Airways. This was started in January, 1952, by CAB. Attempts at a voluntary merger between the two lines have failed thus far and such animosity has developed between their managements that any voluntary deal appears unlikely.

Perhaps the biggest merger before CAB at the present time involves a recently-filed proposal under which Slick Airways would be merged into The Flying Tiger Line to form a giant all-cargo airline. Both are operating under temporary certificates which come up for renewal in August, 1954. They hope to complete their merger by October 1, 1953. Expeditious handling has been indicated by CAB, which got procedural steps underway this month.

The Flying Tiger-Slick merger, if accomplished, would reduce the number of domestic certificated all-cargo lines to two—the proposed merged company and U.S. Airlines. Originally, CAB certificated four such carriers—Flying Tiger, Slick, U.S. and Airnews. Airnews forfeited its certificate last year.

In the irregular carrier field, one big merger is brewing but the going appears, at least, uncertain before CAB. Involved is the so-called "North American combine" which embraces Twentieth Century Airlines, Trans National Air Lines, Trans American Airways, North American Air Coach System, Republic Air Coach System, California Aircraft Company, and Twentieth Century Aircraft Company.

The "combine" has filed for CAB approval of their merger agreement. But a major enforcement proceeding instituted recently by CAB's Office of Enforcement against the group, together with the uncertain status of the Large Irregular Air Carrier Investigation, in which airline members of the "combine" are applicants, precludes any estimate as to how soon, if ever, the merger proposal will be considered by CAB.

As for CAB, emphasis seems to be shifting to trying new route cases after almost a two-year lay-off. But mergers will still get quick handling.

# Aircoach Growth Breaks More Records

AIR COACH flights of ten domestic trunk airlines produced over $100 million in revenue in 1952—by far the greatest year in the brief four-year history of scheduled coach operations.

Last year's total exceeded by $43 million the total revenue figure for 1951 and fell just short of equalling the combined total for the first three full years of scheduled low-fare services.

However, the new record appears destined for a short run as all scheduled coach lines indicated substantial increases in coach traffic for the early months of 1953 along with continued expansion of services. Predictions are that the present year will far surpass record-breaking 1952.

Some of the higher points of 1952 coach statistics, which carriers hope to surpass this year:

- **Over 2.4 million** passengers paid $97.3 million to ride scheduled coach flights, as compared with 1.5 million passengers in 1951 who paid $56.5 million.
- **Available capacity** was increased to 2.9 billion coach seat-miles in 1952, or 1.2 billion more than were available the previous year.
- **Passenger-miles** in coach service increased from 1.2 billion in 1951 to over 2.3 billion in 1952.

These were some of the records compiled by nine domestic lines which operated coach flights throughout 1952, plus a tenth carrier, Colonial Airlines, which entered the coach field on September 28, 1952.

On an individual carrier basis TWA moved away out in front of the industry in most statistical columns, although Eastern Air Lines continued to carry the most coach passengers. Stepping up its transcontinental schedules and adding new intermediate services in 1952, TWA grossed $24,130,986 on coach flights, as compared to $11.7 million the previous year.

Eastern, second, jumped from $13.8 million in 1951 to $18.2 million for its domestic coach services in 1952. American's revenue increased from $8.1 million in 1951 to $16 million last year, United's from $4.1 million to $11.2 million, and Northwest's from $5.4 million to $10.6 million.

Each of the remaining coach carriers showed substantial gains in this department (see table page 41).

Of the 2,417,258 passengers who used scheduled coach services in 1951, over 470,000 rode Eastern, 383,124 rode TWA, and 349,847 rode United. Significantly, in 1949, the first full year of scheduled coach operations, the entire industry carried only 363,482 coach passengers.

Looking into the future, industry and government leaders anticipate that major expansion of scheduled services will be in the coach field.

## Financial Profile of the Aircraft Builders

| Company | Fiscal Year Ended | Sales 1952 | Sales 1951 | Profit Before Taxes 1952 | Profit Before Taxes 1951 | Profit After Taxes 1952 | Profit After Taxes 1951 | Net Profit As % of Sales 1952 | Net Profit As % of Sales 1951 | Backlog of Orders 1952 | Backlog of Orders 1951 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Beech | 9-30 | $ 91,036,168 | $ 32,897,821 | $ 4,861,122 | $ 1,428,457 | $ 1,692,754 | $ 737,424 | 1.85 | 2.24 | $ 230,364,368 | $ 185,774, |
| Bell | 12-31 | 129,514,375 | 82,371,336 | 7,104,441 | 4,477,369 | 3,043,441 | 1,927,369 | 2.34 | 2.34 | 446,000,000 | 369,000, |
| Boeing | 12-31 | 739,010,214 | 357,290,566 | 49,784,449 | 19,840,751 | 14,084,449 | 7,140,751 | 1.90 | 2.11 | 1,648,000,000 | 1,355,520, |
| Convair | 11-30 | 390,997,843 | 322,157,501 | 16,795,330 | 11,550,524 | 10,426,476 | 7,750,524 | 2.66 | 2.40 | 1,000,000,000+ | 900,000, |
| C-W | 12-31 | 326,183,643 | 176,625,380 | 20,897,514 | 14,958,216 | 9,047,514 | 6,908,216 | 2.77 | 3.91 | 1,000,000,000+ | 1,025,000, |
| Douglas | 11-30 | 522,619,000 | 225,173,000 | 33,531,000 | 18,597,000 | 10,792,000 | 6,913,000 | 2.06 | 3.07 | 1,840,111,000 | 1,635,271, |
| Fairchild | 12-31 | 142,023,910 | 75,234,806 | 10,464,871 | 6,197,330 | 3,148,621 | 2,222,130 | 2.21 | 2.95 | 310,000,000 | 249,000, |
| Grumman | 12-31 | 220,669,671 | 167,677,636 | 18,398,205 | 17,199,751 | 5,348,900 | 5,456,000 | 2.42 | 3.25 | 838,225,000 | 673,109,( |
| Lockheed | 12-31 | 438,122,000 | 237,230,000 | 17,458,026 | 9,842,000 | 9,058,000 | 5,793,000 | 2.06 | 2.44 | 1,940,291,000 | 1,510,000, |
| Martin | 12-31 | 143,999,382 | 68,480,519 | 5,808,312 | 22,520,000* | 5,808,312 | 22,178,434* | 4.03 | .. | 650,000,000 | 402,000, |
| McDonnell | 6-30 | 81,743,306 | 66,623,014 | 6,094,392 | 6,918,262 | 3,064,243 | 3,291,262 | 3.74 | 4.93 | 315,818,517 | 278,636, |
| N. Amer. | 9-30 | 317,198,022 | 179,443,376 | 20,320,883 | 15,221,612 | 7,820,886 | 6,421,612 | 2.46 | 3.57 | 1,321,000,000 | 992,000, |
| Northrop | 7-31 | 187,456,926 | 89,947,629 | 7,485,440 | 3,758,053 | 2,420,605 | 3,276,053 | 1.29 | 3.64 | 416,000,000 | 255,000, |
| Republic | 12-31 | 412,235,088 | 130,440,552 | 27,396,000 | 8,082,919 | 8,096,001 | 2,934,613 | 1.96 | 2.25 | 1,000,000,000 | 820,000,( |
| Ryan | 10-31 | 34,975,214 | 22,277,175 | 2,953,359 | 827,604 | 878,359 | 402,604 | 2.51 | 1.80 | 80,000,000 | 41,542, |
| Temco | 12-31 | 55,109,481 | 37,278,187 | 5,174,602 | 2,038,527 | 1,859,602 | 1,131,854 | 3.37 | 3.03 | 276,000,000 | 124,000, |
| United Aircraft | 12-31 | 667,769,234 | 417,211,980 | 51,419,123 | 31,216,605 | 17,809,391 | 14,266,667 | 2.66 | 3.42 | 1,460,000,000 | 1,300,000,( |
| TOTALS | | $1,900,663,477 | $2,668,360,478 | $305,947,072 | $149,634,980 | $114,399,554 | $54,394,815 | 2.33 | 2.04 | $14,771,809,886 | $12,115,852, |

* Loss.

# Industry Sales Up 111%, Profits Up 42%

**Manufacturers pay out $192 million to the Government; eight hit billion dollar backlogs.**

*By* Robert M. Loebelson

THE AIRCRAFT industry has long complained about its low margin of profit, industry leaders becoming especially vehement when new and higher tax rates went into effect in the last half of 1951. Almost without exception, the 1952 annual reports of aviation firms pointed out that while sales increased sharply over 1951, the increase in net earnings was comparatively small, principally because of the higher income tax.

At first glance, a study of the totals for 17 leading aircraft companies would indicate that sales jumped 88% (from $2.668 billion in 1951 to $4.9 billion last year), while earnings after taxes skyrocketed by 110% (from $54.4 million to $114.4 million), thus refuting industry claims.

A closer examination, however, would reveal the principal reason for this distortion. In 1951 The Glenn L. Martin Co. reported a net loss of more than $22 million but returned to the black side of the ledger in 1952 with a net profit of $5.8 million. With Martin's report deleted from the tabulations, the remaining 16 companies had a sales increase from $2.2 to $4.7 billion, or 111%, but their net profits went up only 42% (from $76.5 to $108.6 million).

The 1952 financial reports also give a good inkling of the growth of the industry. In 1951 the 17 companies gave the government and various states more than $95 million in income and excess profits taxes. But by last year increased sales and increased tax rates resulted in a total tax payment of nearly $192 million.

In the aggregate, however, the industry did slightly better last year than in 1951 in calculating its net profit as a percentage of sales, the increase being from 2.04% in 1951 to 2.33% in 1952.

The increase in sales was industry-wide, not a single company reporting a sales decline from 1951. This was principally a reflection of the end of the tooling-up period for the defense effort and the beginning of large-scale production. But the sales increase was not invariably accompanied by a hike in net earnings, Grumman, McDonnell, and Northrop showing a smaller net in 1952 than in 1951.

But increased production involved a requirement for more production workers; every company reported more men (and women) on the payroll when fiscal 1952 ended. All in all, employment by the 17 companies involved went from 390,018 to 473,259 during the fiscal year.

Backlogs also kept going up, rising from a total of $12,115,852,503 to $14,771,809,886, despite the increased deliveries of aircraft and engines. This indicates that the industry's principal customer, the Defense Department, which accounts for 85-90% of all industry sales, was placing orders faster than aircraft companies were delivering the finished product.

Eight companies in the industry reported backlogs in excess of $1 billion, with Douglas and Lockheed pushing the $2 billion mark. Actually at least two additional companies had aviation backlogs of over $1 billion, but General Electric and General Motors do not separate their aviation orders as such. There are numerous other companies with aviation backlogs running into the hundreds of millions, e.g., Ford, Westinghouse, and Kaiser-Frazer. • • •

### Milestone

**The Wright Company was formed to manufacture flying machines. Capital stock: $200,000.**

November 22, 1909

### Milestones

**Largest peacetime order for fighter aircraft and equipment, totaling $14,443,196, awarded by the War Department.**

July 1, 1938

• • •

**The aviation industry backlog throughout the United States reaches $2 billion.**

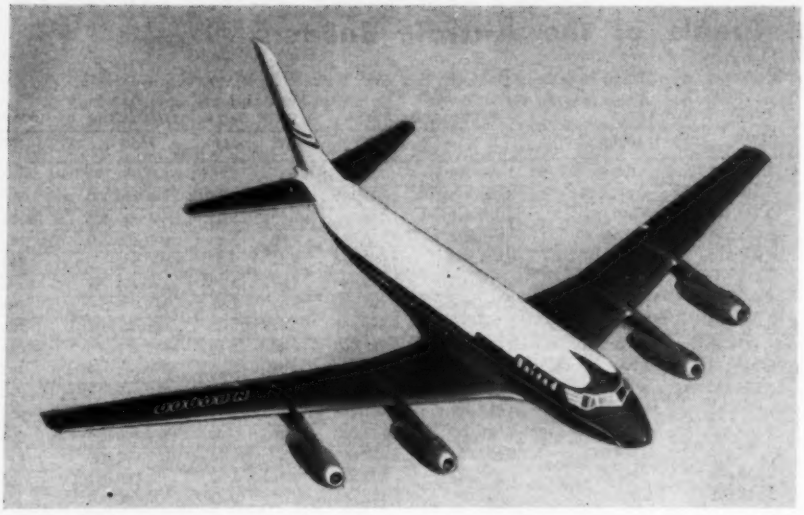
September 26, 1940



DC-6 type aircraft sold, 102 were to

Take the trans-Atlantic situation.

would happen if National actually



**TRADITIONAL** Douglas lines are characteristic of this jet transport model which United Air Lines recently disclosed. Industry speculation is that it is the Douglas DC-8.

# "Big Squeeze" On: Plane Orders Off

## Introduction of scheduled jet service prompts "wait and see" attitude, piston plane sales curtailed.

IT HAPPENED in the fall of 1952. There was an abrupt change of pace. Suddenly the equipment orders, orders which the manufacturers and the rest of the aviation industry had come to think of as "normal," virtually stopped.

This was the lull before the storm. The storm had been brewing for many months, even years, and now it was near at hand. All through the first half of 1952, as in every year since the end of World War II, the aircraft companies kept adding new records to their past accomplishments. More deliveries accomplished than in any peace-time year. More sales. Higher and longer backlogs.

Douglas Aircraft Company, for instance, announced orders for 66 new DC-6A, DC-6B, and DC-7 type aircraft in the first six months of 1952. In the second half this dropped to 13, and to date this year it has been only eleven.

Lockheed Aircraft Corp. announced only 15 L-1049 sales all during 1952. This year the record is only 10 sales to date.

Things are no better for the twin-engine aircraft manufacturer. Consolidated Vultee sold 37 Convair 340's in the first six months of 1952, only 11 in the second six months, and only 10 so far this year.

The storm is here. And the great wind of this storm is generated by the thrust of the jet engine.

If 1952 produced little in the way of decisions as to how to meet the jet threat, it must have made one strong impression on American transport manufacturers: you can't sell piston-engine planes indefinitely.

Things were going along very smoothly for American transport builders for a while. Then the door closed, as airlines who were admittedly not ready for jets began to wonder if it might not be a good idea to watch developments before committing themselves to millions of dollars worth of piston-engine equipment.

### "Big Squeeze"

The "big squeeze" is on in earnest as far as U. S. manufacturers are concerned. The old cry was that the de Havilland Comet series were not economical airplanes (although there is considerable argument as to how economical the Comet III will be) and that the British lead was not a lead at all. This no longer applies.

Aside from the Comet III argument, de Havilland and Vickers-Armstrongs are going ahead with two projects which are being watched with great interest by the world's airlines—the Comet IV (which will probably have a different name) and the V.1000 (formerly VC-7).

These are big planes with the proper passenger capacity requirements; they should be economical planes, if the highly-touted Rolls-Royce Conway engine comes even close to its specifications; and they will be in a speed category (575 miles per hour) which will allow of no improvement because of the excessive power demands of the transonic speed realm.

Even Boeing Airplane Co., which jumped into a lead over its American competitors, is not in too strong a position. Boeing's Model 707, or Project X, is competitive more with the Comet III than with the two larger British planes, although it will probably have a greater passenger capacity.

The two planes will fly about the same time—mid-1954—but Boeing's plane so far is a one-shot prototype, aimed primarily at the military tanker market, while the Comet III will be a production airplane. And if Boeing has an edge in economy of operation (which is not certain) it may be offset by the initial cost. The Comet III is being offered for £700,000 (about $2,000,000); Boeing has quoted no price, but consensus is that it will run about $4,000,000.

Initial cost is not usually the most important factor; but in this case it might be, as airlines seek an interim plane to gain valuable operating experience.

Price is one of two major advantages the American manufacturer must concede to the British; labor in England will always be (as far as can be seen now) much cheaper than American labor. If anything, the trend is toward an increase in the disparity. And labor is a large percentage of the cost of any airplane.

### Unique Engine

But there is perhaps a more important factor. In the Conway engine the British have a powerplant designed especially for transport aircraft; it is not a military hand-me-down.

The U. S. has two major engines which meet the power requirements for the larger (185,000-200,000 pound) transports which will follow the Comet III: the Pratt & Whitney J57 (and its successor, the J75), and Wright Aeronautical's J67 Olympus. These, however, are primarily military engines, with good fuel consumption characteristics but with the accent on military performance.

The Conway has a limited range in which it is superior to other engines, because of its by-pass design; at 500-600 miles per hour, it offers a specific fuel consumption rate better than any known engine development. But this is the speed range in which any jet transport now on the drawing board will operate.

In the transport market, real profits lie only in capturing the broadest possible market. Thus, it is essential to capture the foreign airlines as well as the domestic. This is demonstrated in Douglas' case: in mid-1952, with 41

DC-6 type aircraft sold, 102 were to foreign airlines.

But when Douglas, or any other American company, gets around to marketing a jet transport abroad, it will find many doors already closed by commitment to British planes. It is significant that every one of the airlines which has bought Comets to date is now operating American-built equipment.

All these factors combine to make the bind tighter for the American manufacturer—and add to the indecision.

The squeeze also extends to the airlines. Virtually every airline operating internationally is, or soon will be, faced with Comet competition. Fifty-six Comets have been ordered; they are spread thin, but they blanket the globe.

Pan American's action in ordering three Comets (with options for more) is probably the most startling development, but other, less heralded converts are no less important: Air France, Canadian Pacific, Air India, Qantas, Panair do Brasil, LAV.

Take the trans-Atlantic situation. Pan Am and British Overseas Airways Corp. are scheduled to start Comet III operations in 1956; Air France will probably follow. Where does this leave TWA, KLM and SAS? Can they ignore the propellerless competition and operate their piston-powered airplanes forever? If not forever, when do they join the jet ranks? The longer the period of indecision, the longer the loss of traffic and prestige.

U. S. domestic airlines can, for the moment, take a breather on the jet question. There is no competition. But it could happen here. Air France, for instance, would probably not be operating Comets this year had not Union Aeromaritime de Transport, the independent airline, forced its hand.

The same thing could happen in the U. S. National Airlines already has an agreement with Canadian Pacific Airlines whereby CPA would turn over its Comet IA when it receives delivery of its Comet II's, should National decide to go ahead with the idea. What would happen if National actually started operating the Comet between New York and Miami? Regardless of economic factors, such a move could extend the "big squeeze" to domestic airlines.

National, admittedly, might run into certification problems with the 1A. But it doesn't have to be National, and it doesn't have to be the 1A. It could be any airline with the Comet III. Someone may get tired of waiting for 1960 (the year upon which everyone seems to be agreed is the earliest date for U. S. jet service) and jump the gun. The squeeze would be on.

• • •

## Milestone

**First commercial passenger service with jet aircraft initiated by British Overseas Airways flying de Havilland Comets from London to Johannesburg, S. Africa. May 2, 1952**

## Jet Transports

### BUILT OR FLYING

| | Number | Engines Type | Arrangement | Passenger Capacity | Gross Weight (pounds) | Cruising Speed (mph) | First Flight | Production Availability | Range Miles |
|---|---|---|---|---|---|---|---|---|---|
| Comet I/IA | 4 D.H. Ghost | Turbojet | Submerged | 36/44 | 105,000 | 490 | July 27, 1949 | Completed | 1,740 |
| Comet II | 4 R.R. Avon 3 | Turbojet | Submerged | 44 | 115,000 | 500 | Feb. 16, 1952 | 1953/54 | 2,300 |
| AVRO Jetliner | 4 R.R. Derwent | Turbojet | Submerged | 40 | 60,000 | 450 | Aug. 10, 1949 | No production planned | 1,250 |
| Vickers Viscount | 4 R.R. Dart | Turboprop | Submerged | 48/62 | 52,500 | 320 | July 18, 1948 | 1953 | 1,000 |
| Armstrong Whitworth Apollo | 4 A.S. Mamba | Turboprop | Submerged | 26/31 | 47,000 | 280 | Apr. 10, 1949 | No production planned | 1,130 |
| Bristol Britannia 100 | 4 Bristol Proteus | Turboprop | Submerged | 63/93 | 140,000 | 355 | Aug. 16, 1952 | 1954 | 4,800 |
| Convair Turboliner | 2 Allison T38 | Turboprop | Submerged | 40/50 | 41,800* | 310 | Dec. 29, 1950 | No production planned | 1,550 |
| Saunders Roe Princess | 4 Bristol Proteus | Turboprop | Submerged | 105/300 | 315,000 | 380 | Aug. 22, 1952 | No production planned | 5,500 |

### UNDER CONSTRUCTION

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| de Havilland Comet III | 4 R.R. Avon 16 | Turbojet | Submerged | 58/76 | 145,000 | 500+ | 1954 | 1956 | 2,700 |
| Vickers Viscount 800 | 4 R.R. Dart | Turboprop | Submerged | 66/82 | 65,000 | 312 | 1954 | 1955 | 1,100 |
| Handley Page HP-97 | 4 A.S. Sapphire or Bristol Olympus | Turbojet | Submerged | 96/150 | 200,000 | 550 | 1954 | 1956/57 | 3,000+ |
| Convair R3Y-1 | 4 Allison T40 | Turboprop | Submerged | 150/175* | 150,000* | 350+ | Late 1953 | | |
| Lockheed C-130A | 4 Allison T56 | Turboprop | Submerged | Cargo | 133,000* | 390* | Late 1953 | | 3,000+ |
| Boeing B-707 | 4 P&W J57 | Turbojet | Pod | 80/80 | 150-175,000* | 530-550 | July 1954 | Mid-1956 | |
| SUD CASE SE 210 | 4 R.R. Avon 16 | Turboprop | Submerged | 70 | 125,000 | 455 | 1955 | 1956/57 | 750/1550 |
| Lockheed R7V2 | 4 P&W T34 | Turboprop | Submerged | 105 | 150,000* | 390* | Aug. 1953* | 1955 | 3,000+ |
| Douglas C-124B | 4 P&W T34 | Turboprop | Submerged | 200 | 200,000* | 350* | Mid 1953 | | |
| Convair T29E | 2 Allison T38 | Turboprop | Submerged | 40/50 | 41,800 | 300-350 | ? | ? | 1,550* |
| Vickers 1000 | 4 R.R. Conway (by pass) | Turbojet | Submerged | 100/150 | 200,000 | 575 | 1955 | 1957 | 3,000+ |

### PROJECTS (Estimated figures)

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Douglas MS-19A | 2 Allison T38 | Turboprop | Submerged | Cargo | 63,000 | 243 @ 10,000 ft. | ? | ? | 1,000 |
| Comet IV | 4 R.R. Conway (by pass) or Bristol Olympus | Turbojet | Submerged | 100/150 | 200,000 | 575 | 1956 | 1958 | 3,000+ |
| AVRO Atlantic | 4 R.R. | Turbojet | Submerged | 100/150 | 200,000 | 625 | 1956 | 1958 | 3,000+ |
| Lockheed 193 | P&W J57 or Wright J67 (Olympus) | Turbojet | Fuselage submerged | 100/120 | 200,000 | 550/600 | ? | ? | 2,500-3,000 |
| Douglas DC-8 | 4 P&W J57 or Wright J67 (Olympus) | Turbojet | Pod | 68/100 | 200,000 | 550/600 | 1957 | 1958 | 2,500-3,000 |
| Britannia 200/30 | 4 Bristol Proteus | Turboprop | Submerged | 83/123 | 150,000+ | 355 | 1954 | 1955 | 4,800 |
| Fokker F-27 | 2 R.R. Dart | Turboprop | Submerged | 28 | 31,950 | 246 | 1955 | 1956 | 500 |

*Estimated*

A TRUE STORY OF AIRWORK

# *The President drove the* **TRUCK**

The phone call came through long after the plant closed, and all but the executive staff had gone home. That was over six hours ago. Now, it was midnight on a dark and lonely mountain road.

One more curve in the endless series of uphill turns. Then the headlights picked up the small airstrip . . . the crippled plane . . . the anxious looking men waiting in front of the hangar.

Airwork was delivering an overhauled engine to a customer in trouble. The president drove the truck over 200 miles that night. Like every man in the company, he was taking his place in Airwork's tradition of Personal Service to the customer.

That tradition marks a business where the customer and his needs will always be important. You may never face an emergency as grave as that one. But the same interest and care will be ready to serve you, whether you need an engine, an engine accessory — or just an engine part.

Some of these days you will see a cream and blue Bonanza marked "Airwork Corporation". Talk to the men with it. Talk instrument grouping, ILS approaches . . . do some hangar flying.

You'll see why so many pilots and plane owners — people like yourself — are switching their engine and accessory overhauls and exchanges to Airwork — the company of, by and for pilots.

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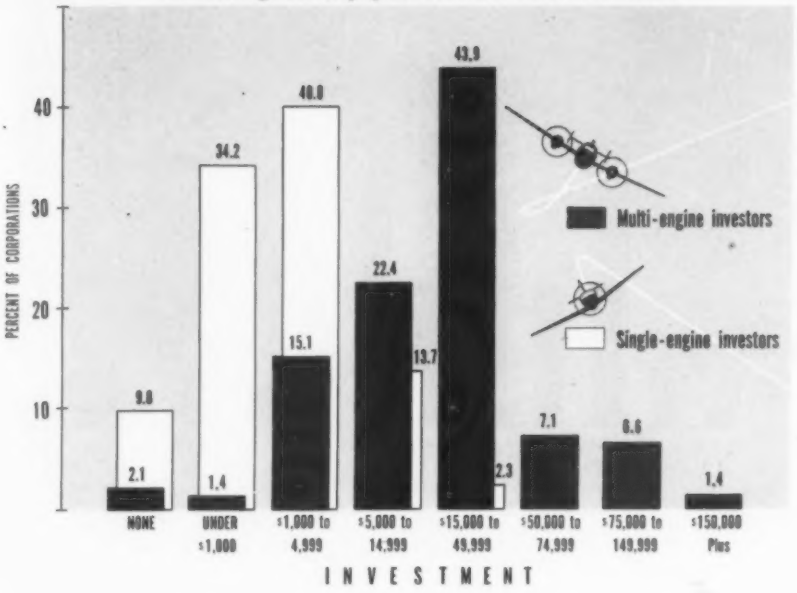
**Investment in Aircraft Accessories, Engine Accessories, Communication and Navigation Equipment in the Past Two Years**




# Profile of Multi-Million Dollar Market

## More than 5,000 corporate users have invested over $30,000,000 in aircraft and equipment, survey reveals.

*By* Lois C. Philmus

THE NEW INDUSTRY of corporation aircraft is growing to proportions that could make it the third largest segment of the aviation group, an American Aviation survey reveals.

The real test for this group comes in July when the excess profits tax probably will be allowed to die, since corporation aircraft have long been believed to be a convenient way of obtaining fairly large tax exemptions. But, according to 81% of the respondents to the survey the corporation-operated aircraft are definitely not a luxury, but have proved their value and become a necessary tool of business. One per cent of the group queried felt it to be partially a luxury; only 18% felt it fell definitely into the luxury category.

The survey has ascertained that there are 5,383 companies and commercial organizations operating approximately 7,500 aircraft. Of this total, it is estimated that 634 companies are operating 1,295 multi-engine planes, supplemented by 310 single-engine aircraft. The remaining 4,749 companies operate single-engine equipment only for a total of approximately 5,895 machines.

For the purposes of a clear picture of the field, the group can be divided into two segments since investment, operation, and utilization vary between the single-engine and multi-engine groups.

While the single-engine aircraft operators are by far in the majority, the multi-engine operators have higher investments, greater potential, and higher utilization.

• **The 634 companies** in multi-engine operation have invested $19,020,000 in aircraft and equipment based on projection of expenditures of survey participants, and in 1951 and 1952 spent $22,495,000 on aircraft and engine accessories, radio and navigation gear.

• **The 4,749 companies** engaged in single-engine operations expended $61,737,000 on aircraft and equipment initially, but the lesser sum of $9,498,000 on accessories during 1951 and 1952.

Although other estimates of the size and utilization of corporation fleets were higher, American Aviation's figures are still impressive: during 1952 the 1,295 multi-engine aircraft flew about 600,000 hours and the single-engine planes clocked in about 1,241,000 flight hours, bringing the total for the group to 1,841,000 hours.

The median annual hourly utilization in the twin group was registered in the 450-to-549-hour range, into which 23.9% of the group falls. The second highest group, representing 19.8%, flew between 350 and 449 hours, and the third highest group of 17.3% hit the higher 550-to-649 range.

A small group 2.9%, went over the 850-hour mark, with 0.4% going over the 1500-hour point.

The greatest utilization achieved by the single-engine companies was 150 to 249 hours, reported by 27.2% of the respondents, with the next highest category of 250 to 349 claimed by 21.2%. The third highest group representing 19.8%, reported operating between 50 and 149 hours a year per plane.

### Accessory Purchases

In expenditures on accessories and communication and navigation equipment, 43.9% of the multi-engine users responding spent between $15,000 and $49,999 in the past two years, with 22.4% having invested less than $14,999 and more than $5,000; 6.6% went as high as $75,000 to $149,999 and 1.4% went over $250,000.

Forty per cent of the single-engine group reported spending between $1,000 and $4,999, with a small 2.3% going over the $15,000 figure. Less than $1,000 was spent by 34.2%.

It is interesting to note that when the entire group was queried on whether they planned to expand, eliminate, reduce or retain their current status, 11% of the single-engine respondents plan on eliminating their aircraft operation entirely, while only one per cent of the twin-engine group had such plans. Fifty-nine per cent of the multi-engine owners plan on expanding their fleet, and 54% of the single-engine owners want to expand, with 34% and 31%, respectively, satisfied with the number and kind of equipment they have. Only 6% and 4% stated that plans were under way to reduce the operation.

### What is a Corporation Aircraft User?

*(Survey of this group by* American Aviation *was based on the following definition:)*

**Business organizations using company owned aircraft as vehicles of transportation, not for hire, but for their own passengers and cargo in the same manner in which they would use automobiles, trains, buses, airlines, and boats. This specifically *excludes* the sole operation of commercial, industrial, agricultural, and charter flying services, which have long been identified as segments of business flying.**

The entire group, because of the slowdown in civilian aircraft production, has had to rely heavily on the used and surplus market for aircraft. In 1952, 51% of the aircraft purchased were used, two per cent military surplus, and 47% new. In 1951, 53% were used, three per cent surplus, and 44% new, which reflects the civilian production slowdown after Korea. The story from 1946 through 1949 was a different one, when the new market outweighed the used and surplus sources.

The respondent group on which this analysis is based included 1,024 companies, of which 847 operate 1,028 single-engine aircraft only and 177 companies operate 280 multi-engine aircraft, supplemented by 137 single-engine planes.

In this group, 76% of the entire group own only one aircraft, 15% own two, and six per cent have three planes. Four or more aircraft are operated by three per cent of the corporate aircraft owners, with 13 companies operating fleets of four; six operate five-plane fleets; four operate six-plane fleets; two have seven-plane fleets. One company each operates, respectively, nine planes, 14, and 15; two companies report 16-plane fleets each; one company, believed to be the largest, boasts 18.

In this large user group the fleets are in the main twin-engine, and in two cases, four engine, supplemented by single-engine equipment.

## Big Build-up

The biggest build-up of company-operated aircraft occurred in 1952, when purchases of 411 aircraft were reported.

The previous year saw the purchase of 300 planes; 1950, 219; 1949, 102; 1948, 102. Prior to 1946, only 18 aircraft were reported purchased.

This group is operating 19 different types of multi-engine aircraft, ranging from the wartime Douglas A-26, Lockheed Lodestar (one of the three most widely used models), the PV-1, the first Twin Cessna and the DC-3 (most popular of the medium sized corporation transports) to DC-6B's, DC-4's, and Convair 240's.

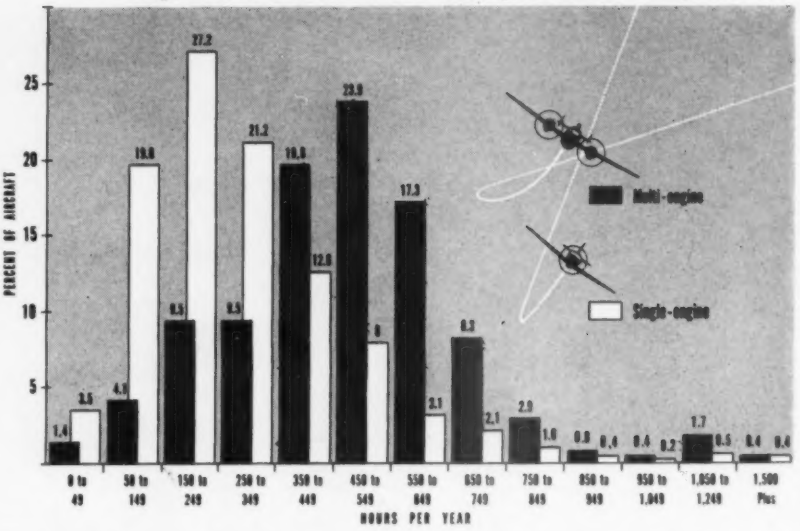
The smaller twins are the Beechcraft, Twin Navion, and Aero Commander. The British de Havilland Dove is becoming more and more popular among the group.

Thirty-four single-engine plane types are in service, including the Boeing Stearman, Curtiss P-40, Republic Seabee, the Vultee BT12-4, and the Spartan series, up to the newer models put out by Cessna, Piper, and Beech.

In this group the Bonanza is most widely used, followed closely by both the Ryan and North American versions of the Navion and the Cessna 170.

Newly designed equipment is of the utmost importance to both segments of the group, though needs of each vary.

**Corporation Aircraft Annual Hourly Utilization Graph**




High initial costs and high operating costs are the main objections to all current models.

While 76% of the single-engine group and 66% of the twin owners reported being satisfied with the equipment they are currently operating, there is a need belt for improvements.

The single-engine users would like to see a small four- to six-place twin, for which the majority of the "unsatisfied" group are willing to pay between $25,000 and $35,000. Reasons given are increased safety (the most important factor to the entire group), improved performance for night operation and marginal weather, and higher speed.

For those satisfied with just one engine, increased speed and longer range is still desired. For such improvement the majority of the group—36%—would be willing to pay from $8,000 to $15,000.

The multi-engine group desires are more varied. Some of the larger owners, operating the medium transports, want pressurization and speeds as high as 300 mph. Twelve per cent of the multi-engine group responding are willing to go over $200,000 for such a plane.

Some in this larger group have found that smaller twin-engine equipment would suffice for their needs.

All like the Aero Commander, Twin Beech, and Twin Bonanza, but feel the price tags are too high for them.

Conclusions drawn from this are that the greatest market lies in the small twin, such as is being planned by Cessna, if the price is kept to the mark, and the twin Piper Apache, which goes into production in June.

Maintenance and operations budgets are very difficult to pin down among the group. Thirty-nine per cent of the single-engine and 40% of the twin-engine companies report no particular budget set aside for either.

Thirty-six per cent of the single-engine users set aside under $5,000 for operations, 30% claim the same amount for maintenance, with 39% alloting the "under $5,000" figure for both.

The reports of the twin-engine group are even more indefinite.

Seventy-eight per cent of the entire group, however, report that all maintenance is sub-contracted to fixed-base operations and overhaul firms. The multi-engine users are more inclined to handle their own maintenance. Fifty-eight per cent of the 7% who reported doing their own maintenance are multi-engine users. Sixty per cent of the 15% who reported doing some maintenance, while subcontracting major overhauls, are multi-engine operators.

Safety is definitely the keynote of the corporate group. While 93% of the multi-engine group report being equipped for all-weather flying, only 74% actually fly under IFR conditions. In the single-engine category, 60% report carrying IFR equipment, but only 27% make use of it.

The equipment is installed as insurance, and evidently the investment pays off. Result of this extreme caution is a reported 0.14 fatalities per 100 million passenger-miles.

Corporation or executive flying has definitely been proven to be a separate non-competitive entity. Because of this feeling, no conclusions have been compared to scheduled airline operations. Utilization is different, as are the problems and equipment needed. This field is a growing one, and one to be reckoned with as a new market by aircraft, engine, and accessory manufacturers—particularly as the defense effort slackens. A new market has definitely been created.

• • •

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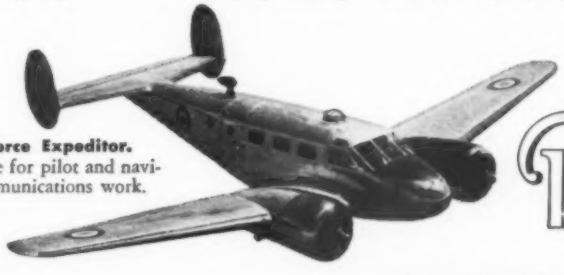

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## Domestic Trunk Lines

Revenues & Expenses

# 1951 Mail Pay Compared to Federal Taxes

The domestic trunk airlines received $36,435,383 for carrying the mail in 1952, and paid the government $49,230,890 in taxes, according to an AMERICAN AVIATION compilation from CAB reports.

The study revealed that mail pay was only 4.7% of 1952's total operating revenues, a drop of almost one percentage point from the 5.6% of 1951. In 1950, mail pay was 8.8%, while in 1940 it came to 26%.

Seven of the carriers paid more in taxes than they received in mail pay—American, Delta, Eastern, National, TWA, United, and Western. The Big Four (AA, EAL, TWA and UAL) accounted for over $40 million of the tax total. In 1951, they paid over $48 million.

The local service lines last year received 49.4% of their revenues from mail pay, compared with 52.6% in 1951. Their tax payments were almost the same for the two years—$399,610 in 1952 against $399,275 in 1951.

## DOMESTIC TRUNK AIRLINES

| | Total Operating Revenues | Mail Revenues | Federal Income Tax |
|---|---|---|---|
| American | $182,229,129 | $ 7,787,782 | $13,643,511 |
| Braniff | 22,822,491 | 897,274 | ..... |
| Capital | 40,395,703 | 1,016,843 | 610,000 |
| Colonial | 5,567,045 | 899,410 | 2,260 |
| C&S | 14,244,566 | 972,813 | 680,000 |
| Continental | 10,204,661 | 1,116,174 | 446,135 |
| Delta | 28,088,468 | 1,027,191 | 2,766,080 |
| Eastern | 111,162,963 | 2,422,859 | 8,350,992 |
| Mid-Continent* | 6,765,588 | 1,098,463 | ..... |
| National | 27,121,437 | 727,177 | 1,904,941 |
| Northeast | 7,099,454 | 1,177,265 | ..... |
| Northwest | 36,455,154 | 1,656,800 | 1,115,000 |
| TWA | 112,209,380 | 4,969,838 | 6,012,334 |
| United | 153,894,834 | 9,946,228 | 12,103,000 |
| Western | 18,173,589 | 719,266 | 1,596,637 |
| **TOTALS** | **$776,434,462** | **$36,435,383** | **$49,230,890** |

## LOCAL SERVICE AIRLINES

| | | | |
|---|---|---|---|
| Allegheny | $ 3,755,016 | $ 1,944,820 | ..... |
| Bonanza | 1,343,473 | 694,720 | ..... |
| Central | 1,790,690 | 1,493,827 | ..... |
| Empire† | 909,486 | 494,017 | ..... |
| Frontier | 4,837,419 | 2,900,934 | ..... |
| Lake Central | 1,299,397 | 949,225 | ..... |
| Mohawk | 2,194,151 | 907,151 | ..... |
| North Central | 3,223,078 | 1,681,541 | ..... |
| Ozark | 3,007,577 | 2,163,091 | 217 |
| Piedmont | 4,507,265 | 1,278,919 | 90,896 |
| Pioneer | 4,300,982 | 1,295,337 | 240,071 |
| Southern | 3,103,188 | 1,859,104 | ..... |
| Southwest | 2,883,069 | 1,031,734 | 52,000 |
| Trans-Texas | 2,734,653 | 1,640,806 | 15,076 |
| West Coast | 1,641,711 | 552,511 | ..... |
| Wiggins | 316,423 | 289,180 | 1,350 |
| **TOTALS** | **$ 41,847,578** | **$20,687,064** | **$ 399,610** |

** Mid Continent up to Aug. 15*

*† Through July 31, 1952 only—Empire merged with West Coast*

Revenues & Expenses

| Airlines | Passenger Revenues 1952 | Passenger Revenues 1951 | Freight Revenues 1952 | Freight Revenues 1951 |
|---|---|---|---|---|
| American | $156,611,141 | $137,683,090 | $9,506,777 | $7,353,634 |
| Braniff* | 20,433,520 | 15,254,677 | 588,448 | 464,159 |
| Capital | 35,817,651 | 34,064,248 | 966,201 | 1,119,595 |
| Caribair | 858,364 | 696,183 | 33,128 | 28,728 |
| C & S | 12,397,203 | 9,978,331 | 325,784 | 220,441 |
| Colonial | 4,415,766 | 3,801,918 | 62,533 | 37,676 |
| Continental | 8,479,960 | 6,290,960 | 210,280 | 146,625 |
| Delta | 25,041,854 | 22,358,416 | 907,796 | 765,540 |
| Eastern | 103,444,574 | 87,224,599 | 1,338,917 | 1,062,647 |
| Hawaiian | 3,169,328 | 2,982,363 | 522,192 | 346,103 |
| MCA† | 4,957,480 | 7,180,152 | 96,243 | 138,806 |
| National | 23,818,194 | 22,596,971 | 1,207,837 | 1,070,961 |
| Northeast | 5,570,123 | 5,535,763 | 112,998 | 106,770 |
| Northwest | 32,027,193 | 26,237,636 | 1,152,863 | 924,262 |
| Trans Pacific | 1,264,065 | 960,618 | 41,241 | 18,585 |
| TWA | 98,925,088 | 83,184,168 | 3,289,962 | 3,010,458 |
| United | 123,067,087 | 95,209,193 | 5,471,536 | 4,399,611 |
| Western‡ | 16,250,201 | 13,687,904 | 291,353 | 208,327 |
| TOTALS | 676,548,792 | 574,927,190 | 26,126,089 | 21,422,928 |

** Figures do not include operations of local service route 106 operated by Braniff Airways since Braniff-MCA merger effective August 16, 1952, but include operations of former MCA trunk routes since merger date.*

| Airlines | Passenger Revenues 1952 | Passenger Revenues 1951 | Freight Revenues 1952 | Freight Revenues 1951 |
|---|---|---|---|---|
| American | $4,318,200 | $4,205,255 | $420,492 | $354,872 |
| Braniff | 6,058,203 | 4,895,172 | 364,056 | 370,218 |
| C & S | 2,706,760 | 2,205,371 | 307,549 | 201,379 |
| Colonial | 1,564,856 | 1,706,344 | 16,809 | 9,620 |
| Eastern | 6,231,659 | 3,668,237 | 113,989 | 71,294 |
| National | 1,636,065 | 1,855,367 | 47,108 | 65,660 |
| Northwest | 9,771,133 | 8,955,129 | 2,886,166 | 2,738,759 |
| Panagra | 12,254,117 | 11,343,863 | 1,095,068 | ..... |
| Pan American[1] | | | | |
| Latin Amer. Div. | 47,051,106 | 45,002,697 | 7,875,782 | 8,039,599 |
| Atlantic | 48,463,326 | 40,155,825 | 5,348,945 | 4,666,857 |
| Pacific | 24,178,766 | 19,861,565 | 3,103,207 | 3,162,992 |
| Alaska | 3,921,376 | 3,598,244 | 1,372,066 | 1,267,363 |
| TWA[2] | 36,366,608 | 31,223,957 | 3,512,685 | 2,973,343 |
| United | 7,100,301 | 5,914,693 | 226,942 | 150,343 |
| TOTALS | 211,622,476 | 184,591,719 | 26,690,864 | 24,062,299 |

[1] *Pan American's figures for 1952 are preliminary.*

| Airlines | Passenger Revenues 1952 | Passenger Revenues 1951 | Freight Revenues 1952 | Freight Revenues 1951 |
|---|---|---|---|---|
| Allegheny[1] | $1,643,091 | $1,839,762 | ..... | ..... |
| Bonanza | 612,397 | 400,552 | $13,465 | $7,196 |
| Braniff[2] | 243,143 | ..... | 6,323 | ..... |
| Central | 367,721 | 249,255 | 13,075 | 5,073 |
| Empire[3] | 269,033 | 407,654 | ..... | ..... |
| Frontier | 1,711,487 | 1,418,127 | 117,275 | 83,520 |
| Lake Central | 295,913 | 281,294 | ..... | ..... |
| MCA[4] | 351,526 | 501,609 | 6,264 | 10,562 |
| Mid-West[5] | 5,593 | 19,854 | ..... | ..... |
| Mohawk[6] | 1,153,784 | 989,994 | 22,145 | 21,305 |
| N. Central[7] | 1,470,536 | 860,598 | ..... | ..... |
| Ozark | 805,597 | 462,633 | ..... | ..... |
| Piedmont | 3,087,249 | 2,604,954 | 53,855 | 38,849 |
| Pioneer | 2,849,924 | 2,287,053 | 69,134 | 56,331 |
| Southern | 1,181,779 | 948,026 | ..... | ..... |
| Southwest | 1,727,621 | 1,452,523 | 48,788 | 47,803 |
| Trans-Texas | 951,675 | 871,646 | 34,060 | 23,750 |
| West Coast[3] | 1,023,247 | 640,262 | 20,855 | 15,100 |
| Wiggins | 19,822 | 23,382 | 44 | ..... |
| TOTALS | 19,771,138 | 16,259,178 | 405,239 | 309,489 |
| Hel. Air Serv. | ..... | ..... | ..... | ..... |
| Los Angeles | ..... | ..... | ..... | ..... |
| N. Y. Airways[8] | ..... | ..... | ..... | ..... |

[1] *Formerly All American Airways. Change in name was effective February 10, 1953.*

[2] *Figures cover operations of local service route 106 operated since August 16, 1952, by Braniff Airways as result of Braniff-MCA merger.*

[3] *Figures are through July, 1952, only. Merger between West Coast Airlines and Empire Air Lines was effective August 4, 1952.*

## Domestic Trunk Lines

| Express Revenues 1952 | Express Revenues 1951 | Mail Revenues 1952 | Mail Revenues 1951 | Total Operating Revenues 1952 | Total Operating Revenues 1951 | Total Operating Expenses 1952 | Total Operating Expenses 1951 | Net Operating Income 1952 | Net Operating Income 1951 |
|---|---|---|---|---|---|---|---|---|---|
| $3,988,212 | $3,279,692 | $7,787,782 | $6,680,182 | $182,229,129 | $157,768,744 | $155,652,431 | $128,038,172 | $26,576,698 | $29,730,572 |
| 420,631 | 361,547 | 897,274 | 1,320,779 | 22,822,491 | 17,763,677 | 21,519,151 | 15,409,296 | 1,303,340 | 2,354,381 |
| 1,086,926 | 1,007,768 | 1,016,843 | 1,175,957 | 40,395,703 | 38,702,493 | 38,376,165 | 34,993,348 | 2,019,538 | 3,709,145 |
| ..... | ..... | 156,667 | 207,387 | 1,107,042 | 989,792 | 1,054,621 | 894,759 | 52,421 | 95,033 |
| 355,670 | 267,091 | 972,813 | 1,202,976 | 14,244,566 | 11,826,791 | 12,805,475 | 10,909,913 | 1,439,091 | 916,878 |
| 48,430 | 39,124 | 899,410 | 831,559 | 5,567,045 | 4,793,394 | 5,726,872 | 4,998,811 | —159,827 | —205,417 |
| 85,012 | 60,521 | 1,116,174 | 1,189,352 | 10,204,661 | 8,120,975 | 9,442,093 | 7,377,068 | 762,568 | 743,907 |
| 432,676 | 421,010 | 1,027,191 | 998,067 | 28,088,468 | 25,312,732 | 24,273,475 | 20,675,101 | 3,814,993 | 4,637,631 |
| 1,650,341 | 1,808,615 | 2,422,859 | 2,244,575 | 111,162,963 | 94,158,530 | 97,154,703 | 74,675,718 | 14,008,260 | 19,482,811 |
| 54,428 | 112,365 | 559,187 | 308,993 | 4,402,844 | 3,851,460 | 4,186,611 | 3,764,606 | 216,233 | 86,854 |
| 65,785 | 105,441 | 1,094,299 | 1,334,450 | 6,336,102 | 9,006,270 | 6,080,498 | 8,475,971 | 255,604 | 530,299 |
| 224,990 | 174,124 | 727,177 | 1,087,092 | 27,121,437 | 26,093,204 | 23,472,338 | 20,645,977 | 3,649,099 | 5,447,227 |
| 100,117 | 98,221 | 1,177,265 | 1,519,980 | 7,099,454 | 7,366,859 | 7,392,355 | 6,977,584 | —292,901 | 389,275 |
| 673,680 | 647,938 | 1,656,600 | 3,988,445 | 36,455,154 | 32,594,207 | 37,208,987 | 30,391,614 | —753,833 | 2,202,593 |
| 8,404 | 6,302 | 208,522 | 126,325 | 1,843,853 | 1,370,263 | 1,786,403 | 1,407,157 | 57,450 | —36,894 |
| 2,701,417 | 2,703,446 | 4,969,838 | 5,366,667 | 112,209,380 | 96,689,176 | 98,297,488 | 83,217,308 | 13,911,892 | 13,471,868 |
| 3,766,674 | 3,537,732 | 9,425,292 | 6,887,757 | 145,904,451 | 112,659,627 | 119,841,579 | 92,728,367 | 26,062,872 | 19,931,260 |
| 252,100 | 194,013 | 719,266 | 1,211,975 | 18,173,589 | 15,664,166 | 15,233,789 | 13,067,039 | 2,939,800 | 2,597,127 |
| 15,915,493 | 14,824,950 | 36,834,659 | 37,682,518 | 775,368,332 | 664,732,360 | 679,505,034 | 558,647,839 | 95,863,289 | 106,084,550 |

† *Figures for MCA are for period from January 1 through August 15, 1952, and do not include operations of local service route 106. Merger between Braniff and MCA was effective August 16, 1952.*

‡ *Figures include operations of former subsidiary, Inland Air Lines, Inc., which company was dissolved and operations merged with WAL on April 9, 1952.*

## International Airlines

| Express Revenues 1952 | Express Revenues 1951 | U. S. Mail Revenue 1952 | U. S. Mail Revenue 1951 | Total Operating Revenues 1952 | Total Operating Revenues 1951 | Total Operating Expenses 1952 | Total Operating Expenses 1951 | Net Operating Income 1952 | Net Operating Income 1951 |
|---|---|---|---|---|---|---|---|---|---|
| $2,337 | $3,496 | $30,229 | $123,315 | $5,115,385 | $4,998,554 | $5,308,316 | $4,820,971 | $—192,931 | $177,583 |
| ..... | ..... | 2,033,219 | 2,068,410 | 8,778,264 | 7,592,795 | 10,109,101 | 7,708,387 | —1,330,837 | —115,592 |
| ..... | ..... | 1,435,882 | 1,853,267 | 4,614,504 | 4,410,139 | 3,507,706 | 3,461,945 | 1,106,798 | 948,194 |
| ..... | ..... | 59,876 | 172,913 | 1,685,796 | 1,929,160 | 1,669,086 | 1,639,707 | 16,710 | 289,453 |
| ..... | ..... | 233,433 | 310,412 | 7,416,531 | 4,160,875 | 5,490,211 | 3,472,166 | 1,926,320 | 688,708 |
| 16,873 | 20,422 | 8,177 | 39,821 | 1,738,627 | 2,014,322 | 2,160,839 | 2,441,220 | —422,212 | —426,898 |
| 68,373 | 70,575 | 5,110,219 | 3,800,470 | 19,199,233 | 16,602,067 | 16,939,720 | 15,744,423 | 2,259,513 | 857,644 |
| ..... | 1,055,653 | 2,501,651 | 2,107,265 | 17,309,546 | 16,143,266 | 15,730,499 | 14,484,514 | 1,579,047 | 1,658,752 |
| ..... | ..... | 10,416,250 | 7,227,000 | 69,790,755 | 64,801,539 | 72,569,535 | 65,079,734 | —2,778,780 | —278,195 |
| ..... | ..... | 12,628,530 | 13,685,551 | 71,734,202 | 63,806,550 | 69,964,110 | 62,948,299 | 1,770,092 | 858,251 |
| ..... | ..... | 11,467,053 | 11,098,518 | 41,118,466 | 35,965,666 | 35,825,425 | 29,573,979 | 5,293,041 | 6,391,687 |
| ..... | ..... | 1,362,680 | 1,035,760 | 7,028,469 | 6,170,117 | 6,562,216 | 5,395,679 | 466,253 | 774,438 |
| ..... | ..... | 3,568,170 | 9,013,659 | 48,337,028 | 48,094,183 | 47,504,762 | 42,960,329 | 832,266 | 5,133,854 |
| ..... | ..... | 520,936 | 676,871 | 7,990,383 | 8,566,068 | 9,725,649 | 9,970,389 | —1,735,266 | —1,404,321 |
| 87,853 | 1,150,146 | 51,376,305 | 53,213,232 | 311,857,189 | 285,255,301 | 303,067,175 | 269,701,742 | 8,790,014 | 15,553,558 |

* *TWA's mail revenues based on temporary rates for both years.*

## Local Service Airlines

| Express Revenues 1952 | Express Revenues 1951 | Mail Revenues 1952 | Mail Revenues 1951 | Total Operating Revenues 1952 | Total Operating Revenues 1951 | Total Operating Expenses 1952 | Total Operating Expenses 1951 | Net Operating Income 1952 | Net Operating Income 1951 |
|---|---|---|---|---|---|---|---|---|---|
| $70,577 | $62,770 | $1,944,820 | $1,875,361 | $3,755,016 | $3,857,936 | $3,874,344 | $3,733,212 | $—119,328 | $124,724 |
| 5,107 | 1,384 | 694,720 | 628,093 | 1,343,473 | 1,055,348 | 1,386,583 | 1,038,781 | —43,110 | 16,567 |
| 4,323 | ..... | 4,164 | ..... | 260,042 | ..... | 368,000 | ..... | —107,958 | ..... |
| 6,459 | 707 | 1,493,827 | 1,030,608 | 1,790,690 | 1,356,843 | 2,115,385 | 1,624,914 | —324,695 | —268,071 |
| 9,075 | 8,305 | 346,527 | 607,310 | 641,980 | 1,075,608 | 649,569 | 1,041,257 | —7,590 | 34,350 |
| 26,994 | 24,764 | 2,900,934 | 2,508,989 | 4,837,419 | 4,104,653 | 4,693,274 | 4,159,376 | 144,146 | —54,723 |
| 26,756 | 28,732 | 949,225 | 516,565 | 1,299,397 | 957,945 | 1,349,128 | 1,131,435 | —49,731 | —173,490 |
| 6,971 | 17,348 | 179,723 | 274,140 | 552,127 | 812,093 | 620,192 | 936,660 | —68,065 | —124,567 |
| ..... | ..... | 121,648 | 380,904 | 127,435 | 401,056 | 151,462 | 380,188 | —24,027 | 20,868 |
| 25,593 | 25,537 | 907,151 | 1,150,294 | 2,194,151 | 2,265,299 | 2,120,860 | 1,598,345 | 73,291 | 666,945 |
| 55,861 | 45,173 | 1,681,541 | 1,181,596 | 3,223,078 | 2,097,607 | 3,307,674 | 2,108,061 | —84,596 | —10,454 |
| 27,778 | 23,215 | 2,163,091 | 1,656,862 | 3,007,577 | 2,150,888 | 2,884,709 | 2,287,313 | 122,868 | —136,425 |
| 39,520 | 34,274 | 1,278,919 | 924,632 | 4,507,265 | 3,653,417 | 4,328,400 | 3,407,524 | 178,865 | 245,893 |
| 21,847 | 20,072 | 1,295,337 | 1,080,986 | 4,300,982 | 3,601,892 | 4,690,540 | 3,365,944 | —389,558 | 235,948 |
| 37,230 | 28,994 | 1,859,104 | 1,628,492 | 3,103,188 | 2,627,902 | 3,256,651 | 2,750,492 | —153,463 | —122,590 |
| 23,718 | 16,857 | 1,031,734 | 789,131 | 2,883,069 | 2,390,964 | 2,740,413 | 2,352,265 | 142,656 | 38,699 |
| 12,817 | 11,294 | 1,640,806 | 1,652,239 | 2,734,653 | 2,630,692 | 2,701,256 | 2,602,485 | 33,397 | 28,207 |
| 13,976 | 6,017 | 552,511 | 651,084 | 1,641,711 | 1,355,988 | 1,938,432 | 1,171,867 | —296,721 | 184,121 |
| ..... | 1,298 | 289,180 | 314,679 | 316,423 | 344,052 | 295,852 | 304,965 | 20,571 | 39,087 |
| 417,244 | 356,741 | 21,334,962 | 18,851,965 | 42,519,676 | 36,740,174 | 43,472,724 | 35,995,084 | —953,048 | 745,090 |

## Helicopter Mail Services

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ..... | ..... | 516,256 | 510,801 | 523,221 | 511,673 | 437,294 | 398,728 | 85,926 | 112,947 |
| ..... | ..... | 460,667 | 376,405 | 463,066 | 383,305 | 481,189 | 321,786 | —18,123 | 58,519 |
| ..... | ..... | 56,507 | ..... | 56,507 | ..... | 126,342 | ..... | —69,834 | ..... |

* *Figures are through August 15, 1952, only, and cover operations of local service route 106 (see footnote No. 2 above).*

* *West Airlines terminated its local service operations May 15, 1952, due to non-renewal of certificate by CAB.*

* *Formerly Robinson Airline Corp. Change in name was effective August 23, 1952.*

* *Formerly Wisconsin Central Airlines. Change in name was effective December 16, 1952.*

* *Merger between West Coast Airlines and Empire Air Lines was effective August 4, 1952, West Coast being the surviving company.*

* *Began operations October 15, 1952.*

## Selected Airline Expenditures, Year Ended Sept. 30, 1952

| Company | Total Assets | Passenger Food Expense | Other Passenger Supplies | Advertising Space | Other Advertising | Aircraft Engine Fuel and Oil | Shop Servicing Supplies | Employment | Annual Payroll | Average Wage |
|---|---|---|---|---|---|---|---|---|---|---|
| Allegheny | $2,014,955 | $1,680 | $4,844 | $49,214 | $9,984 | $468,392 | $29,328 | 458 | $1,832,637 | $4,001 |
| American | 164,299,464 | 4,435,171 | 888,937 | 1,974,115 | 972,662 | 22,881,669 | 1,147,908 | 15,287 | 70,572,512 | 4,616 |
| Bonanza | 722,992 | 1,360 | 3,322 | 13,320 | 5,053 | 143,099 | 10,606 | 168½ | 763,344 | 4,530 |
| Braniff [1] | 24,472,085 | 799,618 | 133,526 | 531,576 | 349,804 | 4,118,086 | 243,488 | 4,048 | 17,563,748 | 4,339 |
| Capital | 19,204,237 | 968,510 | 196,585 | 1,073,043 | 218,119 | 5,561,290 | 289,641 | 4,290 | 18,544,938 | 4,323 |
| Caribbean | 625,558 | 2,743 | 1,699 | 10,927 | 11,288 | 113,590 | 7,261 | 167 | 506,511 | 3,033 |
| Central | 1,014,239 | 2,177 | 1,074 | 19,524 | 7,122 | 228,292 | 31,921 | 260 | 941,987 | 3,623 |
| C&S | 11,645,262 | 535,233 | 61,489 | 239,568 | 124,677 | 2,384,834 | 156,672 | 1,474 | 6,559,639 | 4,450 |
| Colonial | 2,975,062 | 219,118 | 48,459 | 112,243 | 57,844 | 883,343 | 36,496 | 706 | 3,258,144 | 4,615 |
| Continental | 6,364,874 | 194,200 | 15,783 | 127,212 | 106,233 | 1,285,732 | 72,978 | 906 | 3,959,054 | 4,370 |
| Delta | 20,576,254 | 645,548 | 92,083 | 578,733 | 267,916 | 3,485,391 | 225,360 | 2,732 | 11,238,846 | 4,114 |
| Eastern | 114,116,793 | 2,095,462 | 464,757 | 1,316,678 | 648,506 | 14,497,410 | 510,488 | 9,051 | 41,525,557 | 4,588 |
| Empire [2] | ..... | 3,709 | 1,479 | 5,047 | 7,450 | 142,118 | 4,642 | ..... | ..... | ..... |
| Flying Tigers | 12,500,084 | ..... | ..... | 144,456 | 29,638 | 1,230,200 | 42,711 | 1,659 | 8,227,074 | 4,959 |
| Frontier | 1,544,206 | 24,242 | 11,910 | 41,289 | 76,392 | 628,898 | 32,635 | 560 | 2,478,348 | 4,318 |
| Hawaiian | 2,937,001 | ..... | 10,849 | 20,747 | 50,839 | 397,985 | 15,955 | 525 | 2,368,748 | 4,512 |
| Helicopter A.S. | 493,348 | ..... | ..... | ..... | ..... | 20,101 | 4,925 | 45 | 210,240 | 4,672 |
| Lake Central | 507,197 | 2,693 | 1,201 | 19,073 | 11,545 | 137,773 | 4,819 | 153½ | 703,330 | 4,582 |
| Los Angeles | 534,173 | ..... | ..... | ..... | ..... | 24,324 | 1,698 | 52 | 232,104 | 4,464 |
| Mid-Continent [1] | ..... | 175,636 | 28,444 | 132,399 | 44,321 | 1,101,126 | 32,555 | ..... | ..... | ..... |
| Mohawk | 1,532,252 | 2,150 | 2,466 | 13,043 | 9,877 | 276,164 | 18,838 | 246 | 1,093,595 | 4,446 |
| National | 21,153,536 | 741,771 | 143,748 | 868,018 | 225,028 | 3,539,064 | 152,571 | 2,453 | 10,177,515 | 4,149 |
| North Central | 1,676,757 | 765 | 1,184 | 25,553 | 7,670 | 338,720 | 20,745 | 472 | 1,875,707 | 3,974 |
| Northeast | 5,204,171 | 184,144 | 29,717 | 154,157 | 82,482 | 768,004 | 51,417 | 829½ | 3,787,478 | 4,566 |
| Northwest | 42,208,475 | 1,056,607 | 297,029 | 667,639 | 489,162 | 6,844,761 | 555,353 | 5,876 | 27,120,325 | 4,615 |
| Ozark | 1,485,271 | 1,011 | 2,591 | 4,594 | 10,170 | 346,898 | 25,248 | 358 | 1,413,406 | 3,948 |
| Panagra | 21,130,192 | 221,515 | 142,969 | 530,181 | 266,250 | 2,164,688 | 41,571 | 1,578 | 3,881,547 | 2,460 |
| Pan American | 199,075,625 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Atlantic | ..... | 1,343,647 | 49,208 | 1,098,985 | 1,066,960 | 9,760,826 | 299,231 | 4,532 | 20,515,793 | 4,527 |
| Latin American | ..... | 1,356,008 | 526,192 | 990,540 | 974,648 | 8,781,696 | 883,086 | 7,149 | 28,065,334 | 3,925 |
| Pacific | ..... | 524,679 | 255,449 | 406,370 | 455,710 | 5,445,386 | 261,883 | 3,396 | 15,212,896 | 4,479 |
| Alaska | ..... | 191,117 | 35,520 | 18,393 | 57,246 | 987,221 | 13,827 | 386 | 2,235,482 | 5,791 |
| Non-divisional | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 1,981 | 7,943,772 | 4,010 |
| Piedmont | 2,266,019 | 15,167 | 6,839 | 65,700 | 109,197 | 631,601 | 9,055 | 583 | 2,196,513 | 3,768 |
| Pioneer | 5,530,968 | 62,685 | 11,492 | 99,625 | 51,687 | 583,130 | 18,520 | 457 | 2,175,861 | 4,761 |
| Resort | 1,673,392 | 120,381 | 11,496 | 90,448 | 16,504 | 916,038 | ..... | 144 | 885,040 | 6,146 |
| Riddle | 326,907 | ..... | ..... | 3,578 | 2,531 | 451,927 | 7,215 | 136 | 627,020 | 4,610 |
| Slick | 8,104,625 | ..... | 3,119 | 58,731 | 21,744 | 1,462,843 | 113,008 | 1,403 | 5,777,124 | 4,118 |
| Southern | 1,088,472 | 36 | 5,376 | 22,819 | 29,622 | 458,434 | 55,529 | 468 | 1,797,257 | 3,840 |
| Southwest | 1,921,399 | 265 | 2,114 | 49,998 | 27,009 | 328,090 | 32,730 | 351 | 1,582,128 | 4,507 |
| TWA | 145,019,308 | 3,070,904 | 676,942 | 1,741,881 | 1,554,569 | 18,973,619 | 1,129,990 | 14,398 | 65,631,288 | 4,558 |
| Trans-Pacific | 784,579 | 42 | 2,850 | 7,164 | 40,353 | 180,973 | 5,933 | 239 | 946,747 | 3,961 |
| Trans-Texas | 1,165,148 | 15,642 | 4,341 | 24,362 | 53,257 | 375,161 | 12,601 | 350 | 1,437,729 | 4,108 |
| United | 151,029,664 | 2,423,639 | 737,509 | 1,319,637 | 1,420,665 | 16,446,059 | 876,355 | 13,191 | 62,570,984 | 4,743 |
| Western | 16,377,742 | 457,992 | 63,479 | 336,052 | 138,520 | 2,033,724 | 129,232 | 1,621 | 7,723,227 | 4,764 |
| West Coast [2] | 1,768,535 | 570 | 922 | 13,105 | 28,689 | 193,547 | 4,316 | 339 | 1,470,291 | 4,337 |
| Wiggins | 224,711 | ..... | ..... | 1,240 | 1,385 | 29,565 | 1,696 | 32 | 136,650 | 4,270 |
| **TOTALS** | **1,017,295,532** | **21,897,837** | **4,978,993** | **15,020,997** | **10,140,265** | **142,031,792** | **7,622,037** | **105,509** | **469,767,459** | **4,452** |
| Year ending 9/30/51 | 890,170,248 | 18,213,250 | 4,160,177 | 13,819,277 | 8,876,800 | 118,164,952 | 5,418,898 | 94,357 | 388,774,587 | 4,120 |
| Year ending 9/30/50 | 818,250,898 | 12,966,923 | 3,465,601 | 13,168,903 | 7,582,445 | 104,722,385 | 4,458,499 | 81,070 | 319,840,489 | 3,945 |
| Year ending 9/30/49 | 720,176,728 | 13,007,374 | 3,599,919 | 12,029,097 | 6,761,838 | 93,195,538 | 4,963,265 | 78,915 | 295,538,928 | 3,745 |

[1] *Braniff and Mid-Continent merged in August, 1952. Combined assets and employment data are shown under Braniff. Other MCA figures are to Aug. 15, 1952.*

[2] *Empire and West Coast merged in August, 1952. Combined assets and employment data are shown under West Coast. Other Empire figures are to July 31, 1952.*

*NOTE: U. S. Airlines did not file statistics with CAB for the period covered.*

# Airline Assets Top $1 Billion for First Time

The U. S. scheduled airlines—domestic trunk, local service, international and overseas—topped the $1 billion mark in assets at the end of the 12 months to September 30, 1952, and their total employment went over 100,000.

Highlights of the 12 months:

• **Assets reached $1,017,295,532,** a gain of 14.3% over the year ended Sept. 30, 1951.

• **Total employment was 105,509,** up 11.8% over the 94,357 figure of the previous year. The industry's average wage was $4,452 against $4,120, an 8% increase, while annual payroll rose 20.8% to $469,767,459.

• **Gasoline and oil cost the airlines $142,031,792,** compared with $118,164,952, a 20.2% increase.

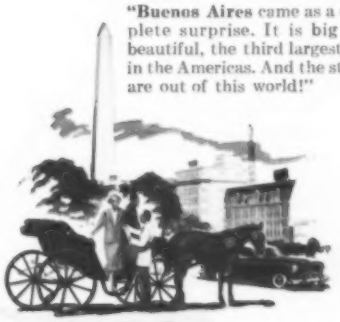
• **Shop and servicing supplies** showed a big jump, up 40.6% to $7,622,037.

• **The airlines spent $21,897,837** to feed their passengers (up 20.2%) and another $4,978,993 for other passenger supplies (up 19.6%).

• **Payments for advertising space** reached $15,020,997, an 8.6% gain, while other advertising costs totaled $10,140,265, up 14.2%.

**"In Lima,** we lived at the luxurious Country Club, which is open to tourists. We played golf mornings, went sightseeing afternoons. The city has the leisurely charm of Old Spain. And due to the cool Humboldt Current, the temperature averages 70°."

**"Scenic Santiago,** Chile, is a fairy-tale city. Here we're standing in front of the marvelous Carrera Hotel. Our rooms in this hotel looked out at a skyline of snow-capped peaks."



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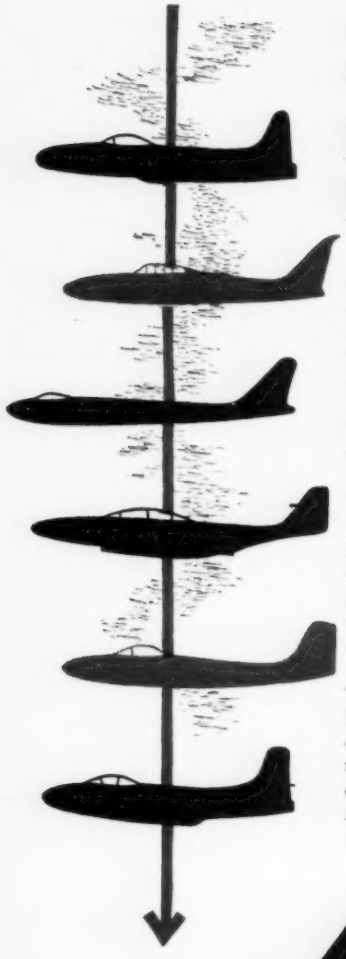

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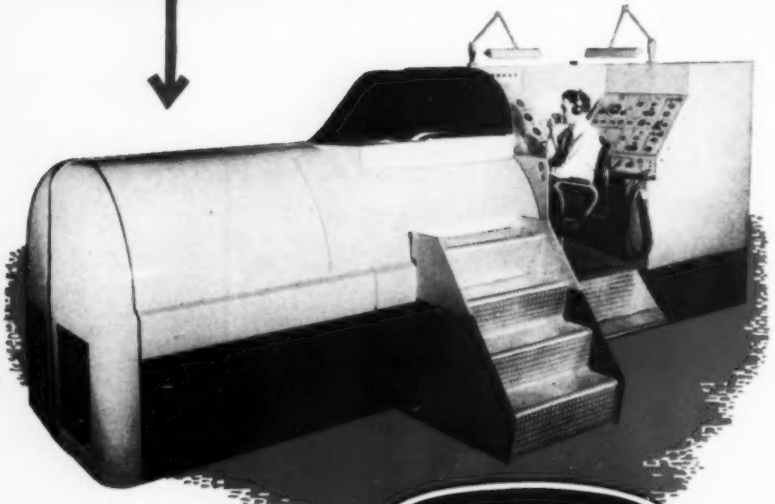

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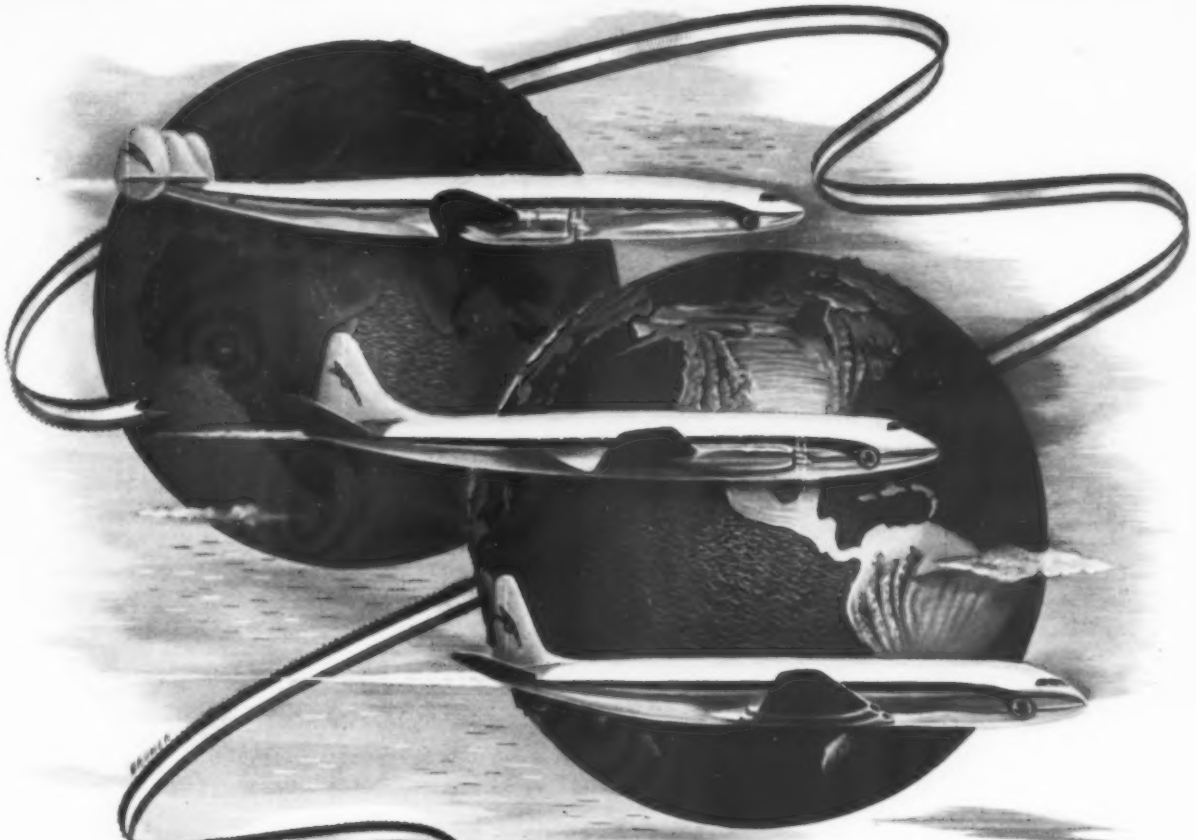

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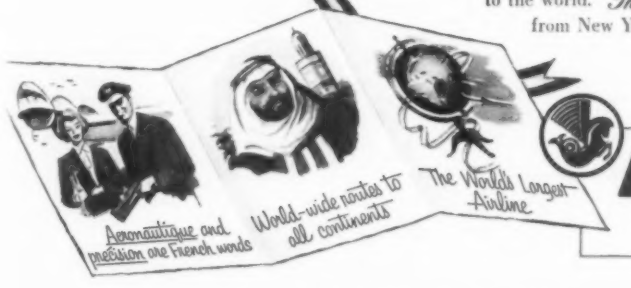


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# Danger Signal: Supply Outstrips Demand

**Drop of 2.5% in domestic load factors cuts revenues $10 million; international slump next?**

*By* Gotch & Crawford
*Planning Consultants*

A BILLION DOLLAR INDUSTRY: a new milestone passed by the U.S. certificated air carriers during 1952. For the first time total operating revenues of the domestic trunkline, international and local service carriers topped the $1 billion mark with $1,130 millions reported.

But total operating expenses also exceeded $1 billion, reaching $1,026 millions. Net operating income before taxes was thus $104 millions, off 15% from the $122 millions record high racked up in 1951. Airline earnings during 1952 may nevertheless be characterized as good to excellent.

There were no spectacular shifts or developments in financial results during the year. Unit revenues and costs varied little from the preceding year's experience, and should hold close to present levels in 1953. The Civil Aeronautics Board's "General Passenger Fare Investigation" could of course bring about reduced unit revenues; but a Board decision in this proceeding before the close of calendar 1953 is unlikely.

**The Money Last Year**

| | Operating Incomes (Before Taxes) |
|---|---|
| Domestic Trunklines | $95,863,000 |
| International Lines | 8,790,000 |
| Local Service Lines (deficit) | (953,000) |
| TOTAL | $103,700,000 |

## Domestic Trunks

Net operating income of the trunkline carriers was $96 millions in 1952, $10 millions and about 10% less than in 1951. Revenues improved 16.6% but were accompanied by a 21.6% increase in expenses.

Unit results did not vary importantly from 1951 experience. Yield per revenue passenger mile was off slightly from 5.55¢ in 1951 to 5.51¢ in 1952 despite the $1.00 per head terminal charge fare increase, reflecting increased use of the lower fare aircoach services. Cost per available seat-mile also dropped slightly from 3.74¢ in 1951 to 3.71¢.

The $10 millions decrease in net operating income is thus primarily attributable to a drop of 2.5 percentage points in passenger load factor from 69.5% in 1951 to 67.0% in 1952, illustrating the sensitivity and leverage of this "how-goes-it" indicator.

The airlines characteristically produce their highest relative earnings when demand keeps up the pressure on supply. During 1952 demand, measured in terms of revenue passenger miles, increased 18.5%. Supply, expressed in available seat-miles, went up 22.9%. Demand pressure was thus eased.

If supply, boosted by the introduction of additional new flight equipment during 1953, continues to outstrip demand, further reduction in load factor and net income will follow. This industry trend will bear watching, perhaps more than any other.

Income taxes will lop about $50 millions off the trunklines' net operating income, leaving a net "take home" profit of $46 millions. This represents a profit margin (profits-to-sales ratio) of 5.9%, which is quite in line with the going rate for service industries.

The reported investment base of the trunks allocable to domestic operations is on the order of $400 millions. Indicated return on investment was accordingly 11.5%.

The trunkline operators continue to depend less and less on the Post Office Department as a source of revenue. The 1952 revenue dollar contained only 4¾¢ of mail pay. Air mail was carried at 53.9¢ per mail ton-mile. It was 60¢ in 1951. Mail is now moving on the trunklines at less revenue per ton-mile than is collected from passengers.

## International

Preliminary data indicate that U.S. International and Overseas carriers experienced a sharp 43.5% drop in their 1952 net operating income of $8.8 millions compared with the 1951 net of $15.6 millions.

Passenger revenues were up 14.6% over 1951, maintaining approximately the same rate of increase experienced during 1951. But revenues from all other sources, amounting to $100 millions, failed to register any gain over 1951. Increase in total revenues was thus only 9.3% better than the 1951 level, while expenses were 12.4% higher.

Yield per revenue passenger-mile dropped moderately from 7.0¢ in 1951 to 6.9¢. Expense per available seat-mile increased slightly from 6.17¢ in 1951 to 6.20¢. Revenue passenger load factor moved from 60.3% in 1951 to 62.8%; but this improvement in passenger traffic was more than offset by the standstill in revenues from other sources, and the relative increase in expense.

U.S. mail pay for the international carriers, at $51.4 millions, for 1952 was somewhat lower than the $53.2 millions reported in 1951, and revenue per mail ton-mile dropped from $2.42 to $2.33. Mail pay accounted for 16.5¢ of the 1952 revenue dollar. In 1951 it had represented 18.7¢.

## Local Service

After two successful years of reporting modest amounts of operating income, the local service carriers recorded an operating deficit of just under $1 million during 1952.

Passenger revenues were 21.6% better than 1951 results, and total operating revenues 16.0% better. But operating expenses jumped 20.7%, which more than cancelled out the improvement in traffic. Load factor, at about 38%, was virtually the same as in 1951.

Total mail pay, reported at $21.3 millions, was $2.5 millions higher than the $18.8 millions reported in 1951, but revenue per mail ton-mile dropped slightly from $23.85 to $23.37. And mail revenue as a percentage of total revenues also decreased slightly from 51.2% to 50.2%. Retroactive adjustments which will follow the numerous local service mail rate proceedings pending may, of course, alter importantly the above reported figures. • • •

# Revolution in 1952: World Coach Network

**With first steps behind them, international carriers move closer to tourist service for world market.**

*By* Sir William P. Hildred, C.B., O.B.E.
*Director General IATA*

IN PREVIOUS YEARS, these annual resumes in American Aviation of the status of the international air transport industry have tended to deal with the statistics of past accomplishments. The important developments in the industry at the moment, however, are ones for which we have hopes, rather than figures.

Hildred

The past year has had important results for the 67 airlines of some forty-odd countries who are joined in this voluntary association and who lift 95% of the world's scheduled international traffic. They carried about 32,000,000 passengers during 1952 (an increase of 3,000,000 over 1951) and performed 440,000,000 ton-miles of cargo transport (25,000,000 more).

While complete statistics are not yet available, we have every reason to believe that they performed this service with a higher degree of economy and efficiency and with at least slightly improved results for their stockholders.

However, the most important thing which the industry accomplished during the past year was the decision to set in motion this month a momentous third step in the accomplishment of a revolution in air transport—one which brings the airlines and the peoples they serve within sight of tourist class travel throughout the world.

The first steps in laying the groundwork for the concept of two classes of fares on the world's airlines were taken in the Americas and within the French Union and proved that, under certain operating and economic conditions, at least, tourist fares were actually feasible.

The second step, taken through the IATA Traffic Conferences, applied the tourist concept to the key route of the whole international pattern—the North Atlantic.

To experiment on this route required courage. In the structure of today's network, any change on the North Atlantic is almost immediately reflected on other routes, some of them on the other side of the world, while the competitive interests of many companies in its rich and steadily flowing traffic pose many other problems.

Tourist fares on the North Atlantic had only been in operation for six months when the member airlines of IATA resolved in their traffic conferences at Cannes last November to institute tourist services in Europe and the Middle East this spring and to extend them gradually around the world by the spring of 1954.

In those six months, tourist service on the North Atlantic had apparently justified the expectations of the airlines that a vast new market, of passengers who had never before flown overseas, would be opened up. The year-end statistics have further strengthened this feeling. Even though operations were greatly curtailed for the first month by an oil refinery strike in the United States, the 11 North Atlantic airlines carried 38% more passengers in the months of May through December of 1952 than they had during the same months of 1951, and 55% of the 340,000 who flew in those eight months took tourist accommodation.

Now we are about to prove out the next step. Tourist services enter into operation in Europe and the Middle East under somewhat different circumstances. On the North Atlantic, the speed of an airplane gives it a considerable advantage over surface transport. Air transport over the sea cannot yet compete with the cheapest steamer fare, but with the added factor of an immense comparative time-saving, airline tourist service can compete with the cabin class of the steamships and draw a sort of vacation traveler who would never have the time to visit between continents by sea.

## World Air Traffic

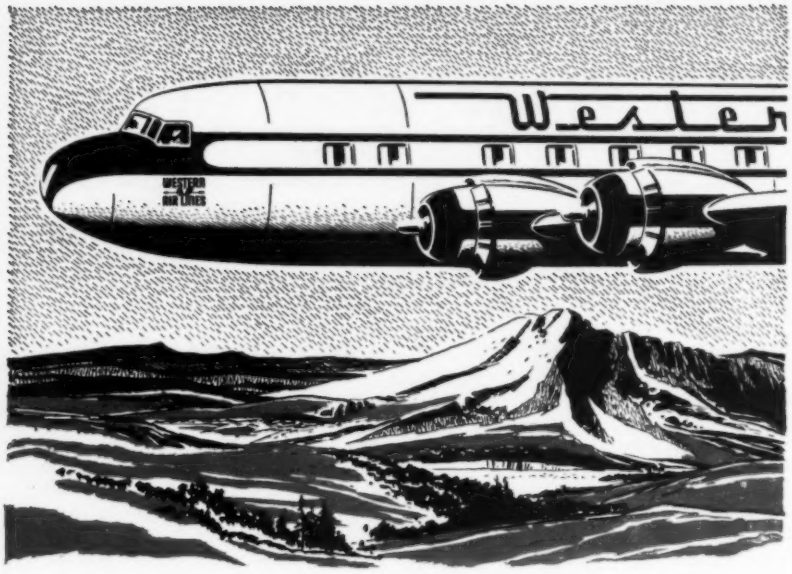
| | Miles Flown | Passengers Carried | Passenger-Miles | Cargo Ton-Miles | Mail Ton-Miles | Average number of passengers per aircraft (number) | Average distance flown per passenger (miles) |
|---|---|---|---|---|---|---|---|
| | | | millions | | | | |
| 1952 | 1 044 | 45.0 | 24 544 | 623 | 178 | 23.5 | 547 |
| 1951 | 988 | 39.9 | 21 375 | 602 | 160 | 21.6 | 536 |
| 1950 | 890 | 31.2 | 16 963 | 518 | 143 | 19.1 | 544 |
| 1949 | 836 | 26.5 | 14 478 | 390 | 128 | 17.3 | 546 |
| 1948 | 789 | 23.5 | 12 987 | 286 | 114 | 16.5 | 552 |
| 1947 | 708 | 21.0 | 11 744 | 187 | 88 | 16.6 | 559 |
| 1937 | 165 | 2.5 | 876 | n.a. | n.a. | 5.3 | 350 |
| | INCREASE OR DECREASE BETWEEN YEARS | | | | | | |
| 1951-52 | + 6% | + 13% | + 15% | + 4% | + 11% | + 9% | + 2% |
| 1950-51 | + 11% | + 28% | + 26% | + 16% | + 12% | + 13% | — 1% |
| 1949-50 | + 6% | + 18% | + 17% | + 33% | + 12% | + 10% | — 1% |
| 1948-49 | + 6% | + 13% | + 11% | + 36% | + 13% | + 5% | — 1% |
| 1947-48 | + 11% | + 12% | + 11% | + 53% | + 30% | — 1% | — 1% |
| 1947-52 | + 47% | + 114% | + 109% | +233% | +103% | + 42% | — 2% |
| 1937-47 | +329% | + 740% | +1240% | n.a. | n.a. | +213% | +60% |
| 1937-52 | +532% | +1700% | +2701% | n.a. | n.a. | +343% | +56% |

*n.a. means not available*
*Exclusions: China and USSR*

*Souce: ICAO*

The continuing growth of air traffic throughout the world is shown in the statistics tabulated above, which were compiled by the International Civil Aviation Organization; the figures for 1952 are estimated.

Domestic and international scheduled air carriers transported 45 million passengers in 1952, against less than 40 million in 1951. The rate of increase slowed up considerably between 1951 and 1952. The total number of passengers carried increased by only 13% between 1951 and 1952, against a 28% increase between 1950 and 1951. A similar change was shown in passenger-miles (15% against 25%) and cargo ton-miles (4% against 16%).




# WESTERN*

## America's Oldest Airline Inaugurates DC-6B Service

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Western first took to the skies on April 17, 1926, flying the Los Angeles-Las Vegas-Salt Lake City air mail route. The fleet then consisted of five open cockpit, two-passenger Douglas M-2 biplanes. A converted motion picture studio was used as the first hangar. At the close of 1926, the airline had carried 209 passengers with a perfect safety record. Western continued to grow and progress. Three 12-passenger Fokker tri-motors were purchased in 1928 for the Los Angeles-San Francisco route. And the airline adopted revolutionary practices such as serving free meals aloft . . . limousine service . . . a string of 37 weather-reporting stations between the two cities . . . two-way radio systems. As far back as 1928, Western was granted radio wave lengths for 11 of its planes. Today, Western flies to 44 cities in 12 western states and Canada. Its fleet of DC-4's and Convair-Liners was recently joined by five big, luxurious DC-6B's for service on the Pacific Coast—all Bendix* Radio equipped.

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In Europe, distances are shorter. Most of the major traffic centers of the Continent are, for example, crammed into a triangle smaller than that of the three cities of New York, Chicago and Miami in the United States. The airlines cannot, in many cases, fly a service that is quicker and more convenient when the journey is timed on a door-to-door basis.

This puts another aspect on the problem of cheap fares in Europe. Whereas on the North Atlantic there will always be a sizeable amount of traffic which will fly at any cost because there is no competing means of transport anywhere near as fast, speed means a good deal less in Europe. Thus price becomes the main new dynamic factor in an expansion of air traffic, and that price must be closely competitive with surface transport.

Basing themselves on this expectation, the airlines in Europe have undertaken a conversion of services to tourist operations on a scale unprecedented in the history of international civil aviation.

### Tourist From Now On

As of the beginning of April, first class services continued only on a few routes, where the density of traffic was so high as to justify catering to the needs of passengers who are willing to pay more for de luxe service. On the majority of European routes, however, tourist operations will be the only type of air transport from now on.

To all intents and purposes the airlines serving Europe are establishing a new price level which is based on tourist conditions and not on first class.

A particularly noteworthy feature of the new European fare structure, however, is the extension of off-peak and night flights and the possibility of quoting lower tourist fares on these off-peak services. Whereas the tourist fare on the North Atlantic is made possible largely by increasing the number of seats in the aircraft and reducing the unit cost of carrying a passenger on a given journey, the necessary economies are achieved in Europe by higher utilization of aircraft.

Whether tourist fares will give the anticipated "jet assist" to European air traffic statistics still awaits the proof of experience. We may not know for perhaps another year whether this price is sufficiently low to attract the extra business or sufficiently high to be economically sound. And the experience of the year may very likely prove to be at least somewhat confused, for the changeover of service on a system as complicated as that of Europe and with

the present fleet resources of the airlines concerned has not been easy and will continue to be difficult for some time to come.

Nevertheless, the auguries are good as this new service starts, and, in any event, the tide of tourist class will roll on eastward through the Orient and across the Pacific.

Short range prophecy can sometimes have disastrous results for a living prophet, and any estimates of the success of the next steps would be hazardous. However, we can say that the problems involved in fitting tourist services to the air routes east of Europe will probably tend more to resemble those of the North Atlantic: beyond Rome, the advantage of the speed offered by the aircraft increases rapidly, perhaps more so even than over the Atlantic.

At the same time, the farther east one goes, fare reductions are likely to become the more necessary in order to bring the price of air transport within the reach of the lower average income.

Once the ring of tourist fares is forged around the world, we shall be able to assess strictly the results of this revolution.

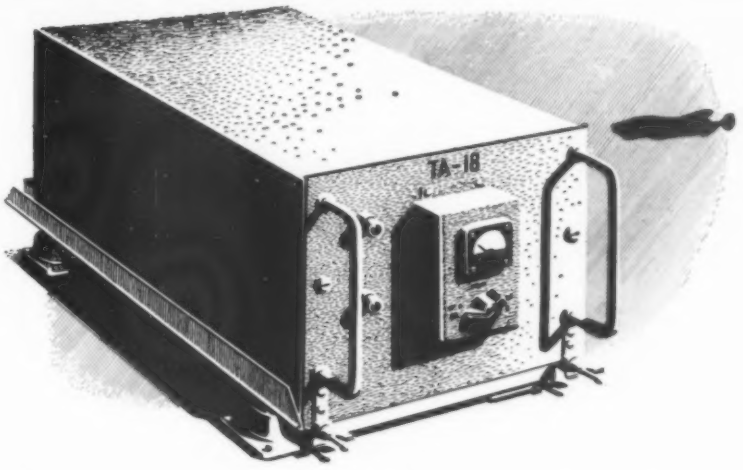
### Larger Economic Base

Already the first fruits of North Atlantic experience indicate that the majority of passengers are flying on tourist services. If we can duplicate this result elsewhere, as seems entirely possible, the economic base of the international air transport industry will have been changed. The fortunes of airlines will be founded, not on the rich passenger, or the expense account passenger, the movie star, the diplomat, or the captain of industry, but on the average man and woman of the world. We shall be closer to being a medium of mass transport as an industry, rather than on a few routes.

If, then, there is a revolution in progress, it is worthy of note that it has been a bloodless one, thanks to that process of fair and voluntary cooperation between competing companies and governments which finds its expression —and its mechanics—in the International Air Transport Association.

IATA is not and cannot be any more than the sum total of agreement between its 67 member companies. The problems involved in reaching agreement on tourist fares, in their earlier initial application, and their more recent and sweeping context, were in many ways the most difficult and strenuous in the history of IATA. In the final result, however, tolerance, good sense and a lively appreciation of public responsibility brought agreement.

• • •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# Jets Reshape Airline Competition Abroad

**Comets and new tariff agreements both play part in changing competition on international scene.**

*By* ANTHONY VANDYK

WITH the introduction of new tariffs and a new prime mover—the jet—the international air transport scene started to undergo two profound changes in 1952. This period of transition will last only a year or two as far as the fare program is concerned—within a year tourist fares will be effective on most of the world's international routes—but its length as regards turbine equipment is a matter for speculation.

The first phase of the International Air Transport Association's tourist fare program and the first scheduled service by jet transports started the same week. During the first week in May reduced tariffs went into effect on the North Atlantic and de Havilland Comet operations were inaugurated by British Overseas Airways Corp. on the London-Johannesburg route.

Despite the almost inevitable slight drop in first-class traffic, the Atlantic tourist fares were voted a success by IATA members and it was decided to extend tourist service to the great majority of the world's air routes. This month tourist fares became effective within Europe and to the Middle East; in October they will be available to Pakistan, India, Ceylon and between Europe and South Africa. By April, 1954, they will be in effect on trans-Pacific routes as well as between Europe and the Far East.

The tourist program has found its strongest sponsors among the operators best in a position as far as equipment is concerned to take care of the additional demand anticipated from the reduced fares. Two of the greatest supporters of tourist service have been Air France and Pan American World Airways, the two largest international carriers. Both started tourist services on certain routes several years before the full IATA program came into effect.

The big companies have not been the only ones to pioneer cheaper air travel. Shortly after the war Aer Lingus, the Irish airline, introduced reduced fares for travel at "off-peak" times between Dublin and points in Britain. Moreover, two British independents, Airwork and Hunting Air Transport, recently began promoting cheaper travel to colonial territories with a "colonial coach" service from England to East Africa operated with unpressurized twin-engine aircraft.

The relationship between fares and equipment is a problem which is causing a little disunity within IATA. Regional carriers using older aircraft are naturally not too happy that they must charge the same fares as those for travel in the more modern equipment of long-distance operators. Passengers between Cairo and Basra, for example, understandably prefer the Lockheed Constellations of BOAC, KLM, Qantas, and PAA to the slower unpressurized equipment flown by Misrair, the Egyptian flag airline, and Iraqi Airways over the same route at the same fare.

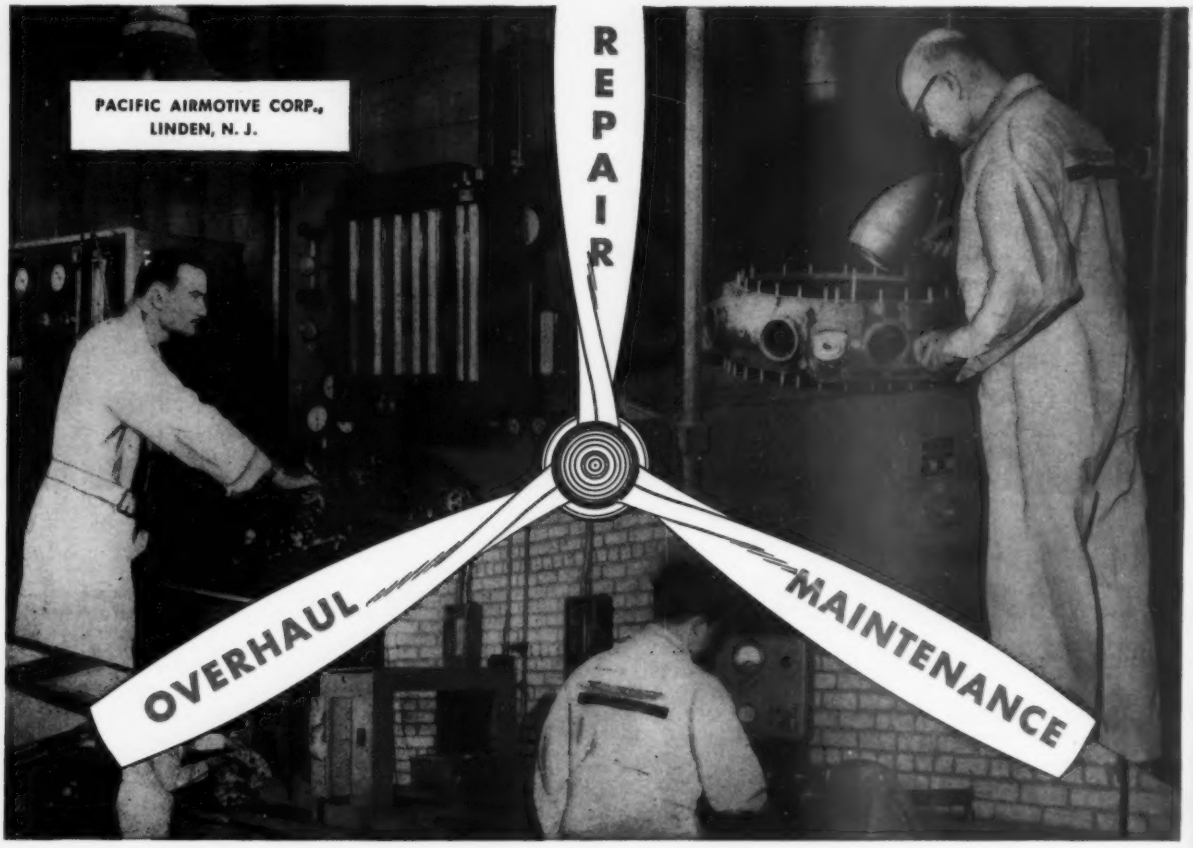
One solution to this problem lies in the hands of the governments of countries where the local carriers are losing business to foreign carriers using superior equipment. This involves the restriction of Fifth Freedom rights, frequencies or capacities of the offending foreign carrier through a revision of the bilateral air transport agreement with that carrier's country.

There is a current trend for some of the less developed countries to realize that the air agreements that they concluded shortly after the war with the more important nations are not serving the best interests of their carriers.

India is an example of such a country—the Indian government very recently requested talks with the United States for the reported purpose of imposing restrictions on U. S. carriers serving India.

In discussions of this nature a nation whose airline does not serve and does not wish to serve the other country is naturally at an advantage. Thus a big airline of a small country may have difficulty in obtaining (and keeping) traffic rights in a country whose airline is not interested in serving the former. An example of such an airline is KLM, which serves (or wishes to serve) almost every country in the world; in negotiations involving air agreements to further the interests of KLM, the Dutch government is at a disadvantage in that few carriers desire to serve Holland.

These political considerations have undoubtedly increased the interest of a number of airlines in schemes put forward for discussion by the Council of Europe, the embryo European parliament. Although unrealistic in view of the strong national sentiments in Europe, the proposals have centered around the establishment of a huge single airline and, although unrealistic in view of the strong national sentiments in Europe,

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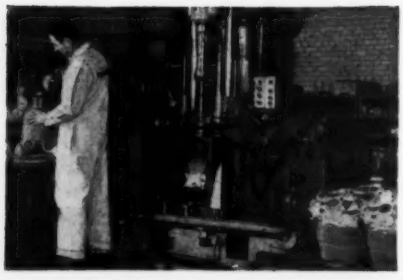

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have provided food for thought.

Believing that an idea of this nature merited more than a mere thumbs-down refusal, six of the European airlines got together last year to think up some constructive counter proposals for consideration by the Council of Europe. The companies involved—Air France, BEA, KLM, Sabena, SAS, and Swissair—established an "Air Transport Bureau" to go into the whole question of integrated operations and present its findings to the Council of Europe.

There is little doubt that the Bureau can be used to achieve greater cooperation between its airline sponsors by streamlining handling and operational procedures, eliminating useless competition, pooling of technical and training facilities, and even introducing an equipment interchange scheme.

A particular advantage of the Bureau (or similar organizations) is that it would allow operators to command greater attention from manufacturers. The group would be in a very much stronger position than an individual company in that it could talk in terms of 50 or more aircraft instead of in threes, fives, and possibly 10's. Under these conditions a manufacturer would be far more eager to meet a specification, and the airlines could thus design an aircraft for their own requirements rather than taking an only partially suitable model offered by the manufacturer.

There is scarcely an international operator today that is not faced with the problem of deciding what new equipment to order.

## Every Horse

BOAC is probably the only company that has settled on an equipment program extending through the early 'Sixties. Almost everywhere else there is indecision and uncertainty, although one company—Air France—has come out in favor of a policy of backing every horse in the race—turbojet, turboprop, and Turbo-Compound. The French flag carrier will operate Comets, Viscounts, and Super Constellations simultaneously under a program which, although likely to cause headaches for the training and overhaul sections, will enable the comparative merits of the three prime movers to be assessed with accuracy.

The present period of hesitancy may last much longer than many people anticipate. If carriers feel that future demand dictates the acquisition of more equipment they will probably play safe and re-order piston-engine types rather than rush into the unknown. The turbine aircraft is still an unknown for the world's airlines (except BOAC) because little data on the results of almost a year of scheduled operation of the jetliner have been made available by either the corporation or de Havilland.

Like most new aircraft, the Comet has had its share of "bugs" and adverse criticism; being the first of its kind, it is particularly vulnerable to both.

Although it is only just coming into service, the turboprop Viscount is in many senses less of an unknown than the Comet. BEA got most of the "bugs" out of the Dart by operating DC-3's fitted with these engines on scheduled cargo services and the airline is starting Viscount operations with a wide knowledge of turboprop techniques. Like the Comet, however, the Viscount is a "first" and is not regarded as perfect by either its manufacturer or its purchasers.

The third (and the largest) British turbine aircraft which is being considered by international operators is the Bristol Britannia, a model whose future much depends on the speed with which Bristol can develop the production model of the Proteus turboprop. Although BOAC has ordered the Britannia 100 in quantity, potential buyers are much more interested in the 200 and 300 series, stretched-fuselage, all-cargo, and passenger versions, respectively.

## Sufficient Service

By this time next year the Comet and the Viscount will have had sufficient scheduled service to point up their advantages and disadvantages; by then more will be known about the Britannia. Thus, for British turbine aircraft 1954 may well be the year of decision. If substantial orders are not placed by then the chances of Britain capturing the world air transport market will diminish.

The year 1954 will also see the first American jet transport take to the air—the Boeing aircraft which is being rushed toward completion at Seattle. Moreover, by 1954 precise information should be available on Douglas' and Lockheed's commercial jet products and when they could be delivered.

The belief that no U. S. jet transport is likely to be in airline service before 1958 at the earliest is prompting the British aircraft industry to launch a new sales campaign ignoring and even depreciating the present Comet and Viscount. This drive will admit that these aircraft are partly experimental, but will stress that experience with them has enabled Britain's "second series" of turbine transports to be designed.

These models—including the Avro delta, the Handley Page HP 97, and the Vickers VC-7—will be available at the same time as the first U. S. jets, but will incorporate the lessons learned from the operation of the present jetliners, the salesmen will point out.

Meanwhile, until the turbojet and turboprop have proved themselves, the turbocompound—the power plant of the DC-7 and Super Constellation—is winning more and more customers. The Turbo-Compound-powered transport represents an important milestone in performance development which has been over-shadowed by the advent of the gas turbine as a prime mover.

Although the Turbo-Compound is usually associated with the Wright R-3350 engine, the British have also developed a simplified engine of this type—the Napier Nomad (AMERICAN AVIATION, March 30)—which is likely to have a big future in long range transport aircraft.

Although the long range operator has a good choice of equipment, the short-haul airlines are in a much less favorable position, and many of the smaller carriers are resigned to operating DC-3's indefinitely.

Particularly in the less developed areas of the world there is a growing need for a "stripped-down" transport—an aircraft with nothing but the bare essentials and selling for about $100,000. "Complexity" has affected the transport as much as it has the fighter, and operators are beginning to recognize that the time has come to start taking off rather than putting on extras.

The smaller short-haul carriers in Latin America, Africa, and Asia—and other continents too—are looking for an air bus; at the moment they are being offered an air limousine.

## No Frills

They do not want aircraft with pressurized cabins and retractable landing gears when such "frills" add tens of thousands of dollars to the tag without significantly improving operating economy. This is why such "frilly" designs as the Canadian CL-21 and the Fokker F.27, priced at about $400,000 each, do not really represent "DC-3 replacements" as far as the smaller operators are concerned.

The only aircraft now in production that can effectively be used as a replacement for time-expired medium-size equipment and which has a tag within the means of most operators is the de Havilland Heron, basically an enlarged Dove with four engines, which has been ordered by airlines in Australia, Brazil, Indonesia, Japan, New Zealand, and Norway. The Heron is, however, smaller than the DC-3 and is really more of a replacement for the Lockheed Lodestar.

Perhaps the most promising of the "DC-3 replacements" as regards low price, simplicity of operation and maintenance, and operating economy is a French design—the Hurel Dubois HD 32, which features a high aspect ratio wing. The prototype of this plane started its flight tests three months ago.

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advantages claimed for the design, the HD 32 is bound to meet sales resistance in certain quarters by virtue of being a French plane; despite the favorable record of numerous prewar and postwar transports produced by France's aircraft industry, many people have a prejudice against French planes (and steamships.

The other two Continental European countries with major aircraft manufacturing industries are Germany and Italy, and neither is likely to sell transport aircraft on a world-wide basis in the foreseeable future. The German industry is still not allowed to build planes, and when this ban is lifted the Germans will probably concentrate on military rather than civil aircraft.

It will be many years before the revived Deutsche Lufthansa airline will consider the products of the German industry for use on competitive international routes.

The Italian aircraft industry is working on several promising transport designs, but without the support of the Italian airlines these are not likely to go beyond the drawing board stage. There is no indication that either the Italian air transport industry or the Italian Air Force will sponsor the construction of these designs; no one else is likely to do so. Both Italian airlines will shortly receive Convair and Douglas DC-6B equipment which will meet their requirements for several years.

Outside the U. S. and Europe there is only one country which has a major aircraft industry—Japan—and there is little likelihood of Japanese transport aircraft production. Japanese international airline operations which will start this year, will be with American equipment, supplemented later by British Comets.

The forthcoming revival of German and Japanese international airline operations points up the quickening pace of competition in the international air transport industry:

- **New airlines** are coming into being and the smaller carriers are expanding their operations. Greek, Irish, and Pakistan flag operations will soon be extended to intercontinental routes, while Sabena and Swissair are planning to extend their operations to the Far East and Latin America, respectively.
- **The battle** for trans-Atlantic cargo traffic will intensify with certification of U. S. and British all-cargo carriers.
- **The British independent** airlines have formulated impressive route programs to be implemented with BEA's and BOAC's surplus equipment.
- **The French independents,** now receiving the latest American and British aircraft, are also expanding their operations. Throughout the world lower fares and higher speeds are opening new horizons to the air transport industry.

• • •

# Co-Existence Seen Vital to French Carriers

**Results: better cooperation between Air France and independents, capital for industry build-up.**

By JEAN-MARIE RICHE

SINCE 1947, the French air transport picture has been dominated by the "coexistence" of a state-owned airline, Air France, and independent privately owned companies. The latter can be classified in two categories: long-haul operators, such as Union Aeromaritime de Transport (UAT), Transports Aeriens Intercontinentaux (TAI), and Aigle Azur; and medium-haul operators operating in the Western Mediterranean and Indo-China.

There is still no legal basis for this "coexistence," although the need for legislation to regulate the air transport industry has been recognized since 1948. While the activities of the independents have grown up parallel to those of Air France, and represent about one third of the traffic volume carried by the national company, the structure of the independent section of the industry is much healthier today than it was five years ago; the surviving independent companies have concentrated on well-defined routes.

The time has now come for a coordination of the independents' activities, both between themselves and with those of Air France. Mergers which have just taken place in the Western Mediterranean area leave only one carrier apart from Air France on the main routes. On long-haul routes between France and Central Africa, competition exists between Air France and UAT; agreement has been reached between Air France and TAI. Aigle Azur remains an "outsider" due to the structure of its route network and the nature of its operations.

France's basic civil aviation legislation will—if ever voted—give formal approval to the principle of the "coexistence" of a nationalized airline and independent privately owned companies. An air transport system serving a community of more than 100 million people all over the world is less suitable for a single operator than the route networks of smaller compact continental European nations like Switzerland, or even Belgium and Holland. Such countries prefer to concentrate on a single state-owned airline. Moreover, the "coexistence" of nationalized and privately owned companies is a practical way for the French air transport industry to get the new capital needed for its development.

Air France has been successful in convincing the French government of the necessity of building up an efficient and up-to-date transport fleet. In view of the permanent difficulties of the French treasury, this will become an increasingly arduous task. The agressiveness of the privately owned airlines should be a strong argument in favor of the continuance of the present policy of providing Air France with an efficient fleet, because the French government wishes to keep its airline in a position where it does not need additional subsidies.

The French independents are, however, in a position to attract more fresh capital from a source which the U. S. air transport industry is forbidden to tap—the shipping industry.

Most French steamship companies consider air transport as a "modernization" of their operations. Some are ready to invest in a big way in air transport—even if this does not bring immediate returns—because they are confident that in the long run this investment will pay off. Since Air France remains as a yardstick of the technical and commercial efficiency of the French air transport industry, there is no fear that shipping companies may use their financial control as a means to suffocate the airlines which they control.

## Investments Justified

Although the present structure and potential of air transportation in the French Union justify the investments made or to be made by both state and private capital, one weak point of the French industry may be the non-availability of French-built equipment.

It was only last year that the French airlines "inherited" the equipment built under the 1946 French aircraft production programs. The big Armagnac, a four-engine transport in the DC-6B class, was tested by TAI and rated technically sound. Heavy operating costs, however, make it a paying proposition only on high-density routes like Paris-Casablanca (where it is now being used) provided that there is little or no competition, thus guaranteeing a high load factor. As TAI is not allowed to operate its Armagnacs without competition, the airline will return them to the French government.

These huge aircraft may make a very useful contribution to the defense of the free world if a proposal goes through to use them between France and Indo-China on a long-haul airlift: a pool of the French airlines operating between France and Indo-China would fly the planes because the French Air Force has neither the equipment nor the men available for such an operation.

Twelve Breguet 763 medium range, heavy four-engine transports are to be delivered to Air France before April 1, 1954. Although coming very late, these double-deck passenger/cargo aircraft are the most valuable contribution made by the French industry to the re-equipment of the French airlines.

It should be realized that the French industry is producing no engine design which can be used to equip transport planes. Hence any airframe built in France has to be designed around a foreign engine, a factor which restricts the industry's scope.

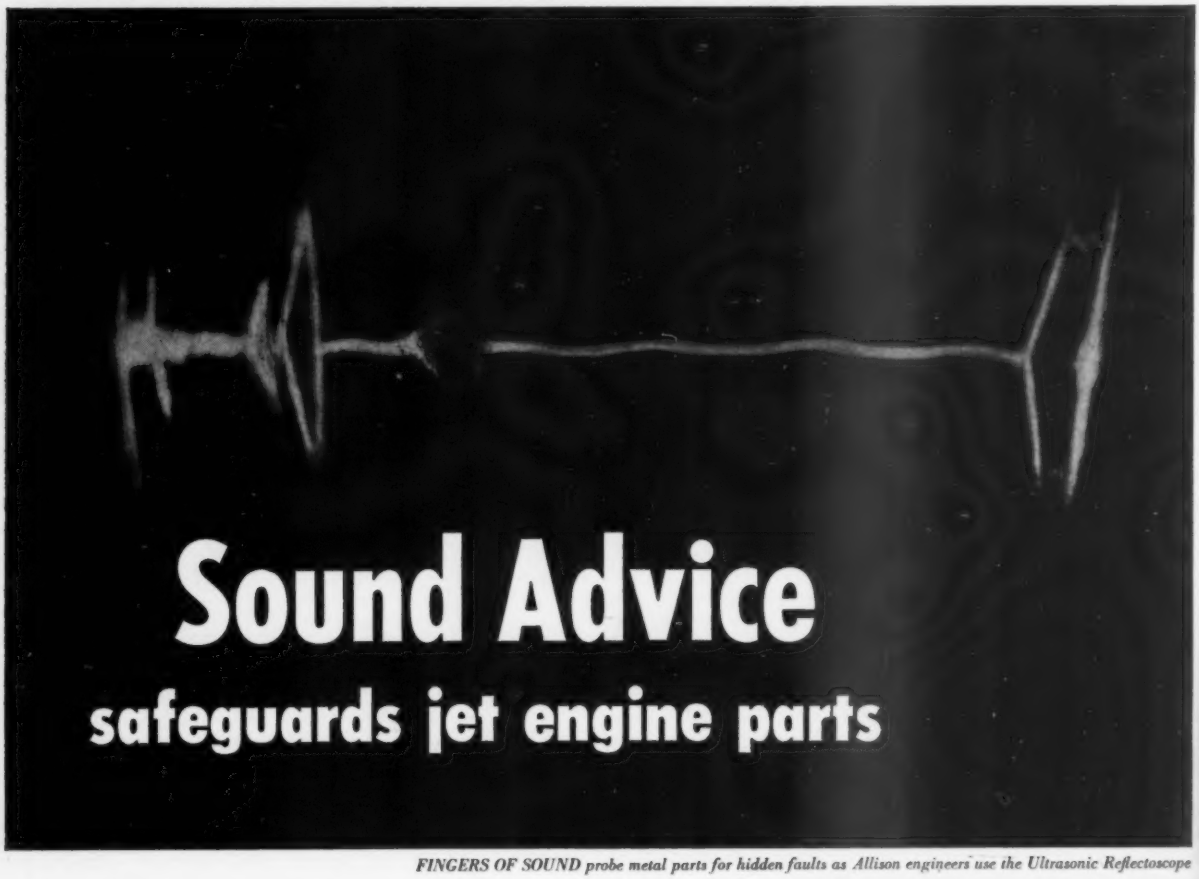
The well proven Pratt & Whitney R-1830 has been selected by Hurel Dubois as the power plant for its HD 32 high-aspect-ratio-wing "DC-3 replacement." This aircraft would be widely used on fast growing, poorly equipped routes in Central Africa. It appears to be the main hope for the French aircraft industry to stage a comeback in the world transport market.

The SE 210 "Caravelle," a twin-engine jetliner built by SNCASE around the engines used in the Comet III and incorporating much of the equipment used in it, is intended for use on medium routes by airlines which operate the Comet III on long-haul routes. It remains to be seen what market there will be for such an aircraft and for its competitor, the Hurel Dubois HD 45, whose future much depends on the success of the HD 31 now being flight tested.

It is of interest to note that the French air transport market is presently shifting from American to British equipment. Late deliveries of Super Constellations by Lockheed to Air France may push the French nationalized airline a little further into the outstretched arms of the British manufacturers; Air France may well build up a fleet of all-European jetliners: Comet III's and SE 210's, both built around the same engine.

UAT has already shifted from DC-4's to 100% British—more accurately 100% de Havilland—equipment: Comet 1A's, II's, and III's for long hauls, and Herons for short routes.

TAI and Aigle Azur have chosen the DC-6B, but executives of both airlines are now thinking in terms of jets. Technical tie between TAI and Air France may lead this company to choose the same equipment as the French national airline. • • •



# Sound Advice
## safeguards jet engine parts

*FINGERS OF SOUND probe metal parts for hidden faults as Allison engineers use the Ultrasonic Reflectoscope*

It is important that the metals used in critical jet engine parts be completely free of even the tiniest flaws. To eliminate the possibility of minute defects that even X-ray testing will not reveal, Allison engineers rely on an *ultrasonic reflectoscope* to test parts.

Allison was the first aircraft engine builder to use this unique means to search out subsurface faults. Here's how it operates: High frequency sound waves are sent into the metal part under test, and flaws of a rejectable nature cause "echoes" which are electrically recorded on a screen. This "sound advice" enables Allison to detect hidden imperfections that could not be discovered any other way.

Tests like this are another reason for Allison leadership, because they are typical of the thoroughness that pays off in greater dependability and has won the confidence of jet pilots of many nations.

*Several engine pieces, like this J33 compressor, receive 100% Ultrasonic inspection*

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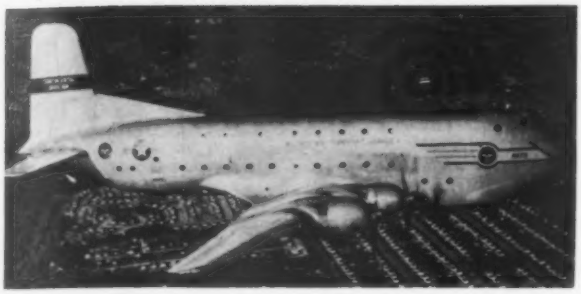
Allison
DIVISION OF GENERAL MOTORS
INDIANAPOLIS, INDIANA

***World's most experienced designer and builder of aircraft turbine engines***—*J35 and J71 Axial, J33 Centrifugal Turbo-Jet engines, T38 and T40 Turbo-Prop engines*

**Fairchild C-119H,** latest of a long series of Packets, grosses 85,900 pounds, is powered by two Wright R-3350 engines with compounding to boost power to 3500 horsepower.

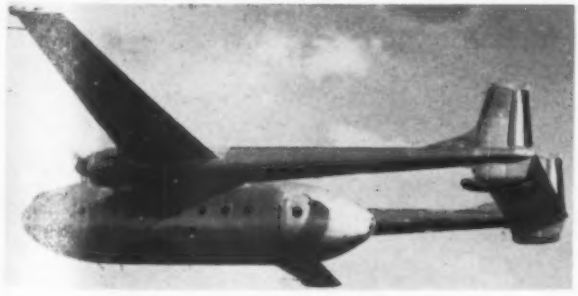


**Douglas C-124,** in use by MATS and TAC, is today's biggest general use transport and is powered by four 3500 horsepower Pratt & Whitney R-4360 engines. Prototype C-124B powered by P&W T-34 turboprops is under construction.

## Military Freighters

**Lockheed's C-130A,** prototype of which is now under construction, is first U.S. transport designed and built for turboprop power. C-130A will be powered by four Allison T-56 turboprops rated at 3750 horsepower each.

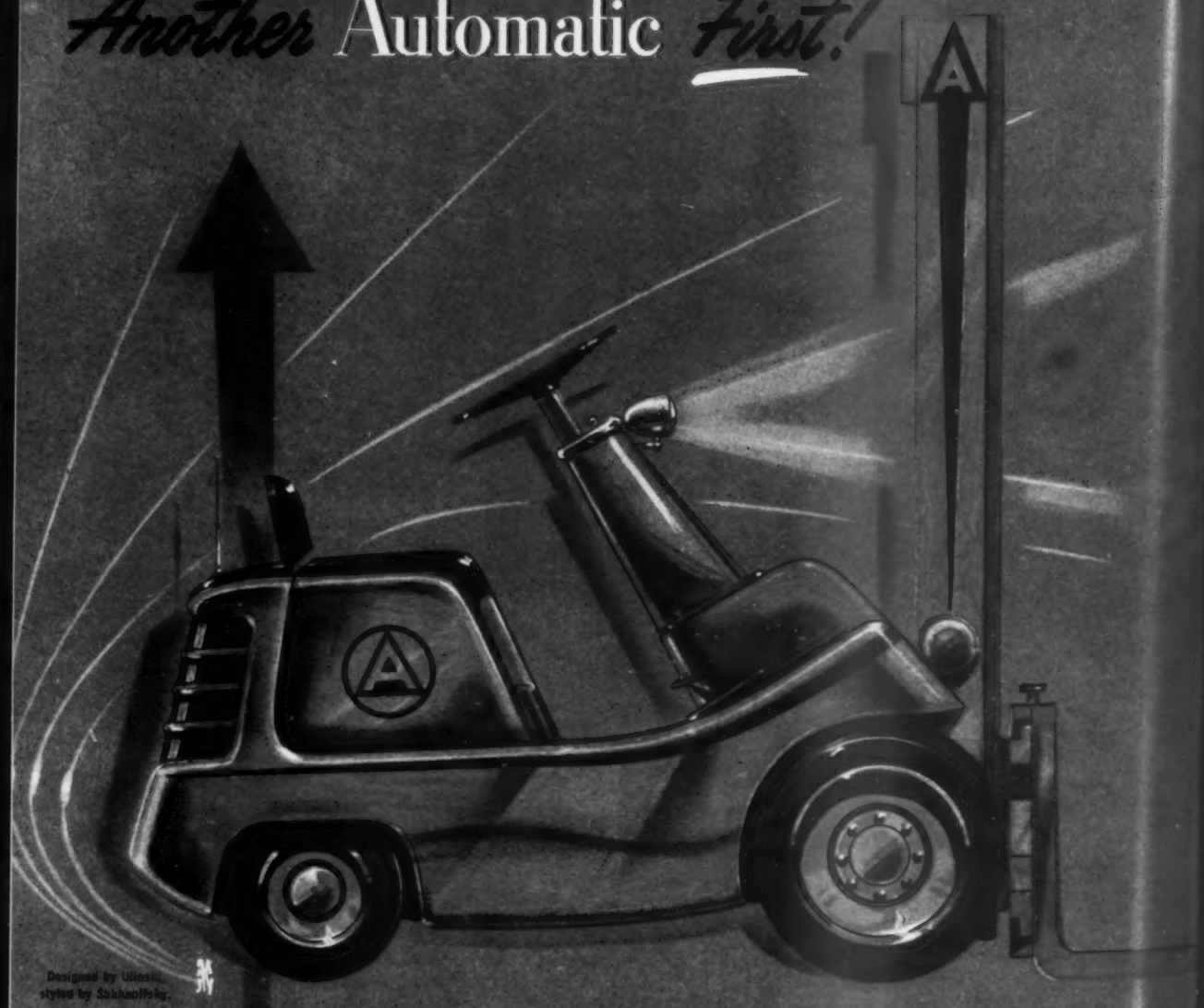
**Boeing C-97** Stratofreighter is now built as KC-97 for use as either tanker or transport. Conversion from one configuration to other is a matter of hours. Plane is powered by four Pratt & Whitney R-4360's rated as 3500 horsepower each.



**Nord 2501** is being built by the Societe Nationale des Constructions Aeronautiques du Nord (SCAN), with 177 already on order for the French Air Force and deliveries scheduled this year. Powered by two Bristol Hercules 739 engines and built in France under license by SNECMA, the Nord 2501 grosses 43,210 pounds, cruises at 215 mph.

**Chase's C-123B** is newest of the assault transports and is powered by P&W R-2800 engines rated at 2500 horsepower each. C-123B is evolution from glider and one version has even been flown with jet engines.

# *Another* Automatic *First!*



Designed by Ulianoff, styled by Sakhnoffsky.

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No gears to shift • No clutch to manipulate • No engine shock due to clutching • No hydraulic torque converter • No over-drive mechanism • No mechanical connection from engine to drive unit • Maximum comfort and ease of operation for driver • Foot operated lift and tilt • Interlocked dual brake system for maximum safety • Electric truck reliability • Infinite acceleration range with minimum power loss • Engine speed automatically adjusts to load requirement • Minimum engine wear—maximum life • Less fuel consumption • All advantages of torque converter and overdrive without mechanical devices • Minimum down time • Maximum accessibility • No aisle projection

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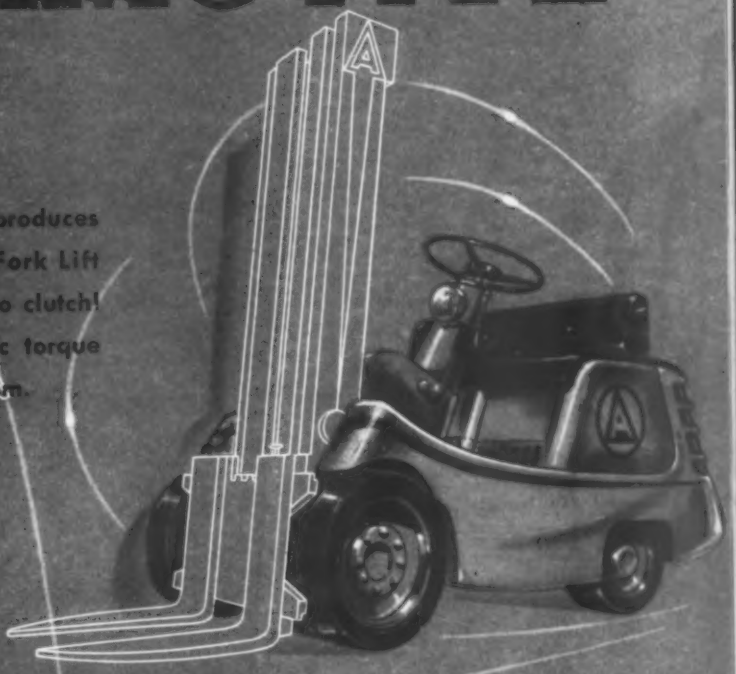
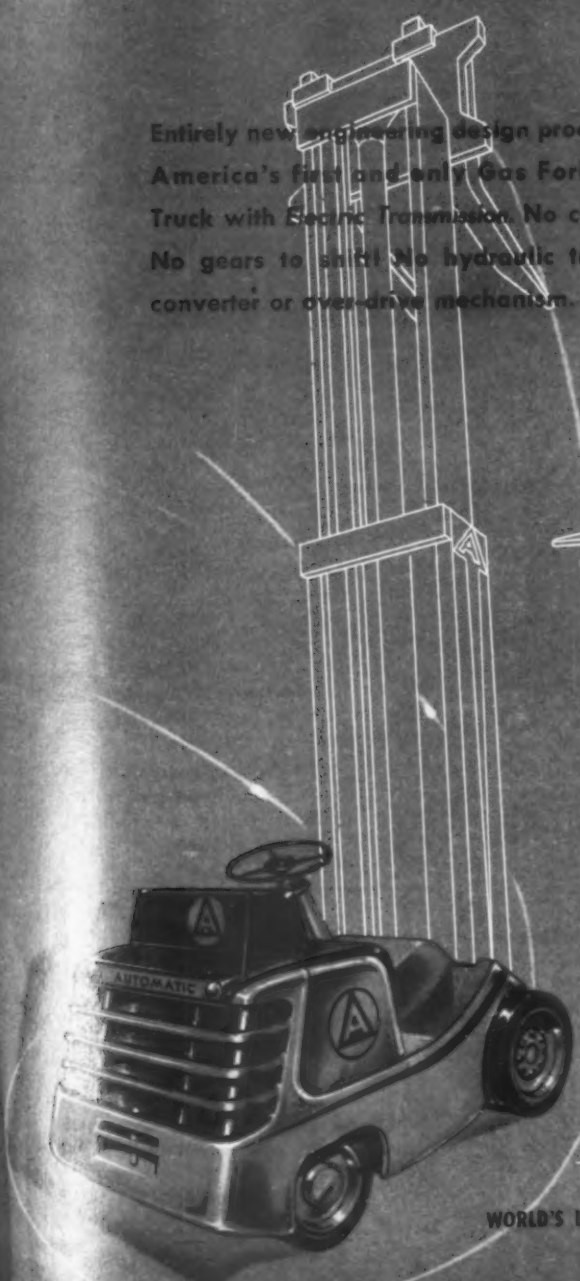
The new Automatic

# DYNAMOTIVE



Entirely new engineering design produces America's first and only Gas Fork Lift Truck with Electric Transmission. No clutch! No gears to shift! No hydraulic torque converter or over-drive mechanism.




This new Dynamotive Gas Truck does for users of materials handling equipment what modern diesel-electric power has done for American Railroads. Its electric, infinite step transmission has no mechanical connections . . . transmits no "clutch shock" to engine . . . but brings to your materials handling jobs that fully controlled smooth flow of power which insures maximum economy and efficiency.

## Automatic

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## Commercial Carrier Pacific Airlift Statistics

(as reported by carriers)

| | 1950 | | 1951 | | Total | |
|---|---|---|---|---|---|---|
| | Tons Cargo | Pass-engers | Tons Cargo | Pass-engers | Tons Cargo | Pass-engers |
| Pan American World Airways | 2,636 | 36,196 | 1,372 | 17,497 | 4,008 | 53,693 |
| Northwest Airlines | 2,241 | 9,494 | 1,084 | 9,865 | 3,325 | 19,359 |
| United Air Lines | 2,139 | 7,681 | 706.6 | 5,343 | 2,845.6 | 13,024 |
| Transocean Airlines | 2,692 | 6,794 | 714 | 6,114 | 3,406 | 12,908 |
| Seaboard & Western | 2,713 | 6,392 | 942 | 3,951 | 3,655 | 10,343 |
| Flying Tiger Line | 2,179.73 | 10,709 | 747.31 | 3,745 | 2,927.04 | 14,454 |
| Overseas National | 1,591.7 | 7,179 | 773.4 | 2,714 | 2,365.1 | 9,893 |
| Alaska Airlines | 812 | 4,019 | 146 | 4,283 | 958 | 8,302 |
| California Eastern | 722 | 9,848 | 191 | 967 | 913 | 10,815 |
| TOTALS | 17,726.43 | 98,312 | 6,676.31 | 54,479 | 24,402.74 | 152,791 |

| | 1952 Cargo Ton Miles | 1952 Passenger Ton Miles | 1952 Total Ton Miles |
|---|---|---|---|
| Pan American World Airways | 28,781,551 | 19,470,270 | 48,251,821 |
| Northwest Airlines | 9,195,819 | 7,368,106 | 16,563,925 |
| United Air Lines* | 7,214,473 | 2,637,660 | 9,852,133 |
| Transocean Airlines | 12,303,238 | 9,313,529 | 21,616,767 |
| Seaboard & Western | 20,792,143 | 5,213,803 | 26,005,946 |
| Flying Tiger Line | 10,923,851 | 12,829,771 | 23,753,622 |
| Overseas National | 11,812,933 | 4,207,585 | 16,020,518 |
| California Eastern | 1,036,229 | 16,133,109 | 17,169,338 |
| United States Overseas** | 7,495,477 | Unknown | 7,495,477 |
| TOTALS | 109,558,714 | 77,173,833 | 186,729,547 |

* *Not reported for second half of 1952*

** *Withdrawn from airlift October 1952*

## Pacific Airlift

(1 July 1950 through December 1952)

**Commercial (Outbound)**

129,000 passengers
20,300 tons cargo
9,600 tons mail
29,900 tons cargo/mail
45,000 total tons
9,000 flights

**RCAF (Outbound)**

4,000 passengers
650 tons cargo
240 tons mail
890 tons cargo/mail
1,400 total tons
460 flights

**CANADIAN PACIFIC (Outbound)**

13,000 passengers
5 tons cargo
25 tons mail
30 tons cargo/mail
1,500 total tons
460 flights

**INBOUND TOTALS**

200,000 passengers
54 000 patients
254,000 passengers & patients
20,000 tons cargo
11,000 tons mail
31,000 tons cargo/mail
58,000 total tons
14,500 flights

**3rd AIR RESCUE GROUP RESCUES**

936 behind enemy lines
7,342 from front lines, sea
8,278 total rescues

**MATS (Outbound)**

53,000 passengers
15,200 tons cargo
3,100 tons mail
18,300 tons cargo/mail
24,500 total tons
4,000 flights

**SABENA (w/drawn July 1952)**

**(Outbound)**
750 passengers
500 tons cargo
400 tons mail
900 tons cargo/mail
1,000 total tons
200 flights

**OUTBOUND TOTALS**

200,000 passengers
36,600 tons cargo
13,300 tons mail
49,900 tons cargo/mail
73,400 total tons
14,500 flights

**TOTAL INBOUND AND OUTBOUND**

400,000 passengers
54,000 patients
454,000 passengers & patients
56,600 tons cargo
24,300 tons mail
80,900 tons cargo/mail
131,400 total tons
29,000 crossings

**AIR EVACUATION**

39,100 battle casualties
15,500 other patients
54,600 total evacuations

## PAA Tops Carriers In Pacific Airlift

COMMERCIAL carriers continued to dominate the Pacific airlift during 1952, by design of Military Air Transport Service, of course, for MATS, with too few aircraft to handle its global commitments, decided early in the lift to let commercial airlines carry the brunt of the load.

Nonetheless the statistics make an impressive testimonial to the value of commercial airlines in case of emergency: for the first 30 months of the lift (through the end of 1952) the U.S. flag airlines can point to these accomplishments:

• **They have carried 64.5%** of all the passengers hauled to the Far East.

• **They have hauled more than 55%** of the total cargo lifted to the war zone, and more than 72% of all mail.

• **They have hauled more than 61%** of the total Pacific lift tonnage (outbound) and made almost twice as many flights as MATS, the Royal Canadian Air Force, and Sabena (now out of the lift) combined.

Pan American World Airways and its subcontractors again led the field on the basis of total ton-miles, handling a little more than a fourth of the total lift. Second was Seaboard & Western Airlines, followed by The Flying Tiger Line and Transocean Airlines. Pan Am's subcontractors are American Airlines and Capital Airlines. Northwest Airlines also has one subcontractor—Trans World Airlines.

Latest figures show 59 commercial planes in the lift: Pan Am, including subcontractors, 14; Flying Tigers, 10; California Eastern and Transocean, seven each; Northwest (including TWA) and Seaboard & Western, six each; United Air Lines, five; and Overseas National Airways, four.

One other line beside Sabena has dropped out of the lift—United States Overseas Airlines, which was withdrawn in October. Sabena left in July. • • •

### Milestones

First trans-Pacific flight, first westbound Atlantic crossing, and first round-the-world air tour made by Air Service officers from Seattle. Distance, 26,345 miles; flying time, 363 hours; elapsed time 175 days.

April 6-September 28, 1924

Clipper arrives at Hong Kong, completing the first commercial flight across the Pacific.

April 28, 1937

## Airlift to Thule

*Combined Inbound and Outbound Traffic Between U.S. and Thule and Other Bases in Greenland.*

| Month | Passengers & Patients | | Cargo and Mail (tons) | | Total Tons | | Crossings | |
|---|---|---|---|---|---|---|---|---|
| | Month | Cumulative | Month | Cumulative | Month | Cumulative | Month | Cumulative |
| March 1951. | 40 | | 100 | | 110 | | 50 | |
| April ..... | 110 | 150 | 490 | 590 | 510 | 620 | 170 | 220 |
| May ..... | 210 | 360 | 1,110 | 1,700 | 1,130 | 1,750 | 380 | 600 |
| June ..... | 550 | 910 | 850 | 2,550 | 920 | 2,670 | 300 | 900 |
| July ..... | 2,410 | 3,320 | 760 | 3,310 | 1,050 | 3,720 | 340 | 1,240 |
| August .... | 2,160 | 5,480 | 640 | 3,950 | 880 | 4,600 | 290 | 1,530 |
| September . | 760 | 6,240 | 850 | 4,800 | 940 | 5,540 | 270 | 1,800 |
| October .... | 2,300 | 8,540 | 790 | 5,590 | 1,060 | 6,600 | 260 | 2,060 |
| November . | 1,050 | 9,590 | 690 | 6,280 | 820 | 7,420 | 230 | 2,290 |
| December . | 990 | 10,580 | 430 | 6,710 | 540 | 7,960 | 140 | 2,430 |
| January 1952 | 300 | 10,880 | 400 | 7,110 | 440 | 8,400 | 130 | 2,560 |
| February .. | 870 | 11,750 | 380 | 7,490 | 480 | 8,880 | 150 | 2,710 |
| March ..... | 1,200 | 12,970 | 360 | 7,850 | 510 | 9,390 | 150 | 2,860 |
| April ..... | 1,090 | 14,060 | 930 | 8,780 | 1,060 | 10,450 | (See May '52) | |
| May ..... | 1,250 | 15,310 | 850 | 9,630 | 1,010 | 11,460 | 600 | 3,460 |
| June ..... | 1,880 | 17,190 | 710 | 10,340 | 930 | 12,390 | 300 | 3,760 |
| July ..... | 1,850 | 19,040 | 410 | 10,750 | 620 | 13,010 | 210 | 3,970 |
| August .... | 1,670 | 20,710 | 600 | 11,350 | 800 | 13,810 | 220 | 4,190 |
| September . | 2,290 | 23,000 | 480 | 11,830 | 740 | 14,550 | 190 | 4,380 |
| October ... | 1,980 | 24,980 | 510 | 12,340 | 740 | 15,290 | 180 | 4,560 |
| November .. | 1,630 | 26,610 | 440 | 12,780 | 620 | 15,910 | 170 | 4,730 |
| December . | 1,360 | 27,970 | 630 | 13,410 | 790 | 16,700 | 150 | 4,880 |

# MATS Scores With Operation Blue Jay

### Thule airbase construction completed; lift to continue on four-flight-a-day basis to maintain supplies.

*By* James J. Haggerty, Jr.

IT HAS NOT received much attention, but in addition to the Pacific Air Lift, the Military Air Transport Service is operating another lift, on a smaller scale, but is nonetheless a great demonstration of the value of the airplane in transport operations. It is the lift to Thule, Greenland, also known as "Operation Blue Jay," which has just completed its second year of operation.

The lift became necessary when the Air Force decided in early 1951 to build a giant Arctic air base at Thule. The problem was how to get construction workers, equipment, and supplies to the location, since the water route, through Baffin Bay, was closed to shipping more than nine months a year due to ice formations.

There was available a small airstrip, which had previously been used only by an occasional plane bringing supplies to a joint Danish-U. S. weather station at Thule. Since the Air Force wanted to get started on the project before the sea routes would become open in July, 1951, the Thule airlift was born.

The lift started in March, 1951, with MATS Douglas C-54's handling the bulk of the cargo and Douglas C-124's hauling in the heavy equipment needed for preliminary construction work. By the time Baffin Bay became open to navigation, MATS had transported more than 3,000 construction workers, along with prefabricated huts to house them and heavy construction equipment and materials.

Because of the restrictions on water transport, MATS had to continue the operation year-round. In two years of operation, MATS carried 30,288 passengers, plus 14,814 tons of critical supplies in 2,657 round trips from Westover AFB, Mass. Averaging nearly four flights a day, MATS crews covered 15,000,000 route-miles over some of the most treacherous territory in the world—without a major accident or a fatality.

AIR ROUTE of Operation Blue Jay.

MATS makes no claims to sole credit for the construction feat at Thule, admitting frankly that the bulk of supplies required to build and maintain the 90,000-acre air base was carried in ships of the Military Sea Transport Service. But it points with pride to the statement of the Army engineers who supervised construction of the base—that the air lift advanced the completion date of the important base by a full year.

Major construction was completed last fall, but the air lift continues on its four-flight-a-day basis, for the need for sustaining supplies continues on a 12-month basis and MSTS cannot handle the requirements on a seasonal basis.

The continuance of the Thule air lift highlighted another year of operations of Military Air Transport Service, which will celebrate its fifth anniversary on June 1. From its start of operations on June 1, 1948, to the end of 1952, MATS airlifted more than 1,400,000 military passengers, 219,000 medical patients, and nearly 300,000 tons of high priority cargo around the world for the three military services.

In terms of mileage, this amounted to 2,900,000,000 passenger-miles, 602,000,000 patient-miles, and 930,000,000 ton-miles.

Other accomplishments of MATS during the past year include:

### Air Transport

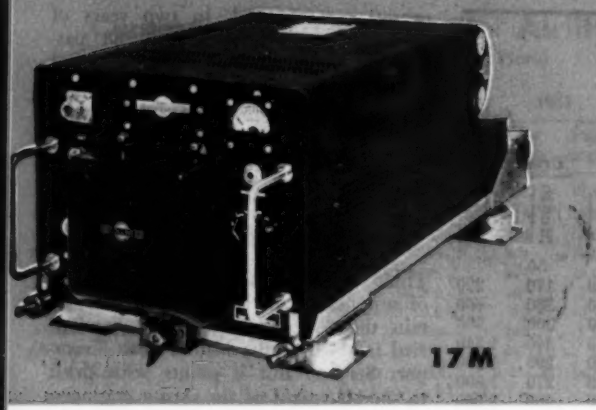
Aircraft of the Pacific, Atlantic, and Continental Divisions airlifted more than 508,000 passengers, 62,000 patients, and 89,000 tons of cargo. This amounted to a total of 955,000,000 passenger-miles, 145,000,000 patient-miles, and 291,000,000 ton-miles.

In the trans-Pacific air lift, the Pacific Division crossed the ocean 11,326 times, hauling 175,000 passengers, 14,000 patients, and 30,000 tons of cargo.

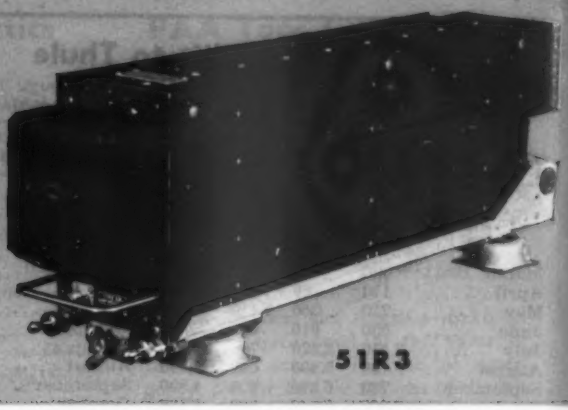
### Air Rescue Service

ARS added another 116 "retrieves" from behind enemy lines to its imposing total for this type of work. In addition, it evacuated more than 4,000 wounded men picked up from front lines or at sea.

In 31 months of Korean warfare (through January 31, 1953, latest date for which data are available), ARS has performed 8,377 rescues—941 from be-



17M



51R3

**17M 360-CHANNEL VHF AIRBORNE TRANSMITTER** — Introducing another Collins quality product in the aviation field: 17M VHF Transmitter. Full 360 channels in the frequency range of 118.0-135.9 megacycles. 50 watt power output with phone emission. Meets ARINC Spec. #520.

**51X 360-CHANNEL VHF AIRBORNE COMMUNICATIONS RECEIVER** — Companion to 17M Transmitter. Complete new design to meet ARINC Spec. #520 for 50 kc bandwidth. Same famous Collins fingertip remote control circuitry as used for 51R receiver and adopted as standard by airborne equipment industry. The Collins 51X has the sensitivity, selectivity and spurious response rejection characteristics required for flight and airport traffic control.

**51R-3 AIRBORNE NAVIGATION RECEIVER** — Here is the receiver that fulfills the navigation and communication receiving requirements of all types of military, commercial, and private aircraft using the 108 to 136 megacycle band. (The 51R-3 provides for omnirange, localizer for instrument landing and communication reception.) Channel selector for the equipment is arranged to accommodate the addition of a glide slope receiver and distance measuring equipment. Thus, choice of appropriate localizer and glide slope channels is afforded from a single control unit. The 51R-3 Receiver is engineered to provide the ultimate in accuracy and dependability in all types of aircraft.

# a COLLINS report on e
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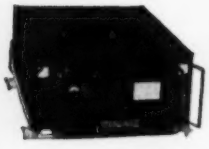
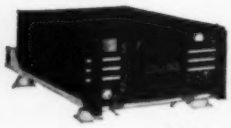


618S



18S-4

180L-2

## OTHER PROVEN PRODUCTS FROM COLLINS ELECTRONIC RESEARCH

**618S 144-CHANNEL HF TRANSCEIVER** — Airline transmitting-receiving equipment with 100 watt power output on 144 crystal controlled channels. Automatically tuned elements insure maximum flexibility and high power output.

**18S-4 10-CHANNEL — 20-FREQUENCY TRANSCEIVER** — Transmitter-receiver for commercial or executive aircraft. Frequency range of 2.0 to 18.5 megacycles. One hundred watt power output.

**180L-2 AUTOMATIC ANTENNA TUNING UNIT** — Automatically matches 18S or 618S output to aircraft antenna.

## COLLINS PRECISION TEST EQUIPMENT

**478B GLIDE SLOPE SIGNAL GENERATOR** — This unit provides crystal controlled test signals for bench-testing Glide Slope Receivers in the band 329.3 to 335.0 mc.

**478C IFS TEST EQUIPMENT** — Bench tester for Collins IFS Computer, automatic pilots and other flight director equipments.

**479T-2 SIGNAL GENERATOR** — This is precise ramp-test equipment for airborne VOR localizer and glide slope receivers.

**479S-3 AUDIO SIGNAL GENERATOR** — Generator is used in precision bench testing omni-range, localizer and glide slope receivers. Output signals for VOR, localizer, and glide slope audio circuit investigations are provided.

17L-3

COLLINS INTEGRATED FLIGHT SYSTEM AND NAVIGATION COMPUTER

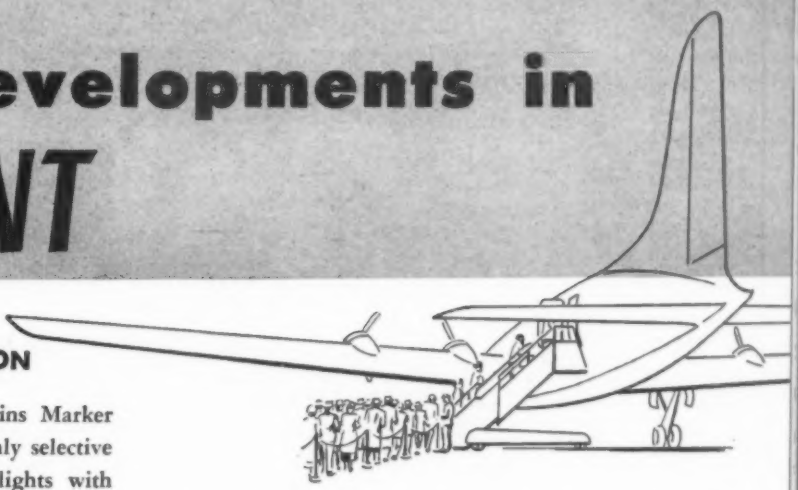
**17L-3 180-CHANNEL VHF AIRBORNE TRANSMITTER** — Frequency range is 118.0 to 135.9 megacycles, and all 180 channels are easily selected on a simple, positive remote control system. Power output is conservatively rated at 8 watts. Hundreds of these dependable transmitters are now furnishing consistently reliable service.

**17L-4 360-CHANNEL VHF AIRBORNE TRANSMITTER** — Transmitting facilities are provided on all channels reserved for aircraft communication in the VHF band. Ease of operation and dependability are the same as the Collins 17L-3, but power output is increased to approximately 25 watts and 50 kc channel spacing is provided.

**INTEGRATED FLIGHT SYSTEM** — Simplifies ILS approache by presenting precisely computed steering information i conjunction with simplified pictorial type instruments. In strumentation also simplifies enroute navigation.

**NAVIGATION COMPUTER** — The Collins NC-101 Naviga tion System provides the pilot continuous position informa tion. Required data is fed into the electronic computer on previously prepared punch card. Punch card then activate the Computer, giving the pilot a continuous fix measured i miles from his destination along a chosen course.

# electronic developments in EQUIPMENT



## NEW AVIATION AIDS IN PRODUCTION

**51Z-1 MARKER BEACON RECEIVER** — Collins Marker Beacon Receiver is completely dependable, highly selective and free from spurious response. Operates lights with minimum "twilight" indication.

**51V-2 GLIDE SLOPE RECEIVER** — The 51V-2 is designed for reception of 90/150 cps tone modulated glide slope signals on any of the twenty channels in the UHF range of 329.3 to 335.0 megacycles.

*Collins designs and manufactures a complete line of radi communications equipment for the aeronautical services. You inquiries are welcome and we suggest you investigate suc new developments as Collins TVOR and microwave for ai lines. Please specify the type of descriptive literature desire*

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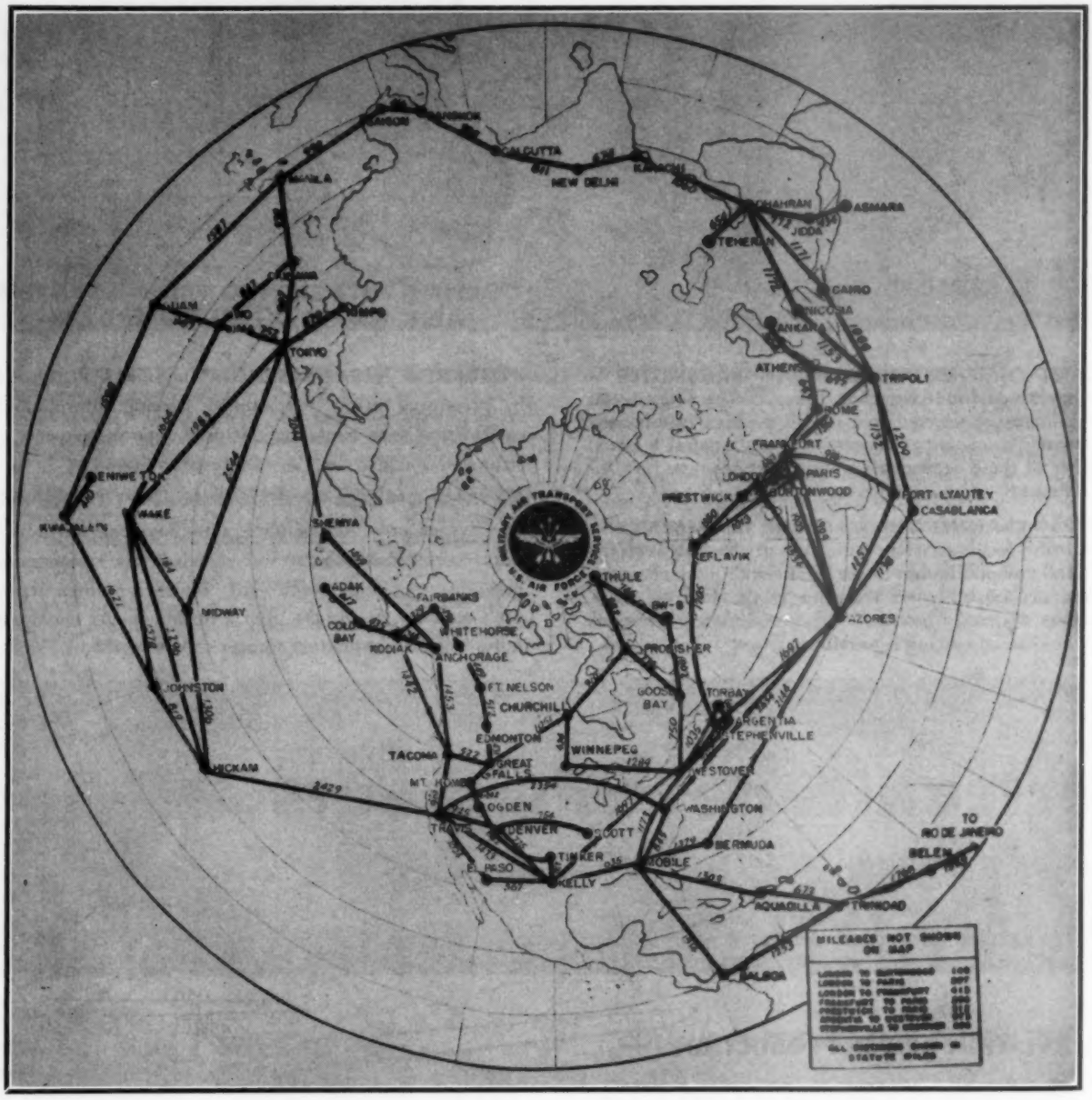
COLLINS

**COLLINS RADIO COMPANY, Cedar Rapids, Iowa**

11 W. 42nd St., NEW YORK 36 — 1930 Hi-Line Drive, DALLAS 2 — 2700 W. Olive Ave., BURBANK

## INTERNATIONAL ROUTES OF MILITARY AIR TRANSPORT SERVICE




hind enemy lines, 136 from the sea, and 7,300 from other areas. Of the "behind enemy lines" total, 201 of the rescuees were valuable, hard-to-train air crew members.

Mainstay of the ARS fleet is the Sikorsky H-5 helicopter, which performed almost three-fourths of all the rescues, including more than 76% of the behind-the-lines rescues. Behind it comes the larger Sikorsky H-19, which handled 1,769 rescues (about 22%), including 80 behind the lines. The H-19, however, has been operating in Korea only 22 of the 31 months.

ARS units, formerly designated squadrons, were redesignated groups during the year in line with the expansion of their operations.

### Air Weather Service

The Alaska-based 58th Strategic Reconnaissance Squadron, which flies regular weather missions over the North Pole, passed the 700-mission mark. In the Atlantic, the 53rd Squadron, based in Bermuda, flew more than 30 flights, tracking and predicting eight hurricanes, while the Guam-based 54th Squadron tracked 26 tropical typhoons on more than 130 flights.

The 54th and 56th Squadrons, operating from Japan, flew more than 1,300 weather flights in support of Korean operations.

AWS also continued to provide global meteorological service for USAF planes through its more than 250 weather stations, 20 mobile weather vans, and six reconnaissance squadrons.

### Airways and Air Communications Service

During the year, AACS inaugurated the first Loran Squadron, to provide long range navigation for transport aircraft and other planes requiring long-range, over-water guidance. AACS also demonstrated the first of its 42 flight-facility-checking aircraft—a flying

electronic laboratory to determine the best method of flight checking AACS facilities.

### Flight Service

Flight Service continued to develop operations of the selective air raid warning system, in cooperation with Air Defense Command. FS handled more than 1,850,000 flight plans and passed to appropriate agencies more than 1,000 test air raid alerts.

### Other Services

Air Photographic and Charting Service joined the MATS family during the past year (April 16, 1952). Formerly Air Pictorial Service, APCS handles monthly distribution of five million aeronautical charts.

Air Resupply and Communication Service activated a special squadron on November 1, 1952, to develop a balloon flying program for the USAF. The squadron is testing different launching, tracking, and retrieving techniques on a research project for making meteorological observations of the upper wind fields.

### Equipment on Order

MATS transport units have on order undisclosed quantities of Douglas C-118's (DC-6A's) and C-124 heavy transports. Both types are already in operation. In addition, MATS has orders for Convair C-131 twin-engine transports (military counterpart of the Convair-Liner), which will be used for evacuation work.

Air Rescue Service and Air Resupply and Communications Service have on order Grumman SA-16 amphibians and Sikorsky H-19 and Piasecki H-21 helicopters.

On order for Navy units of MATS are Douglas R6D's (same as C-118's) and Lockheed R7V's (compound-engine Super Constellations). • • •

# Navy FLAW Has Steady Growth in '52

THE NAVY's Fleet Logistic Air Wings continued a steady growth during the past year, with deliveries of new, larger aircraft, addition of route segments, and a personnel increase of more than 25%.

• **Two new plane types** were placed in service—the Douglas R6D, Navy version of the DC-6A, and the Lockheed R7V-1, compound-engine version of the Super Constellation. In addition, FLAW is preparing to take deliveries of a number of Convair R3Y-1 turboprop flying boats, which will be in service during the coming year.

• **Personnel strength** of the two wings now stands at 7,384, including 900 officers and 6,484 enlisted men. A year ago the combined units had 5,864, including 847 officers and 5,017 enlisted men.

• **A transcontinental route** from Naval Air Station, Patuxent, Md., to Moffet Field, Calif., was inaugurated, and, due to increased fleet activity in European waters, Naples-London and London-Lages (Azores) route segments were set up.

• **FLAW extended its safety record** another year without an accident. The combined wings have now flown 800 million passenger-miles without a fatality since the last accident in October, 1950.

The Fleet Logistic Air Wings are an outgrowth of the merger of Naval Air Transport Service and Air Transport Command, which formed Military Air Transport Service.

At the time of the merger, a Department of Defense directive authorized the Navy to operate another transport unit, independently of MATS, to handle the specialized air transport requirements of the sea-going fleet. This unit started as a small organization, but, due to the demands of the Korean war and the increased fleet activity in the Pacific, grew into a fairly large route system operating on four continents.

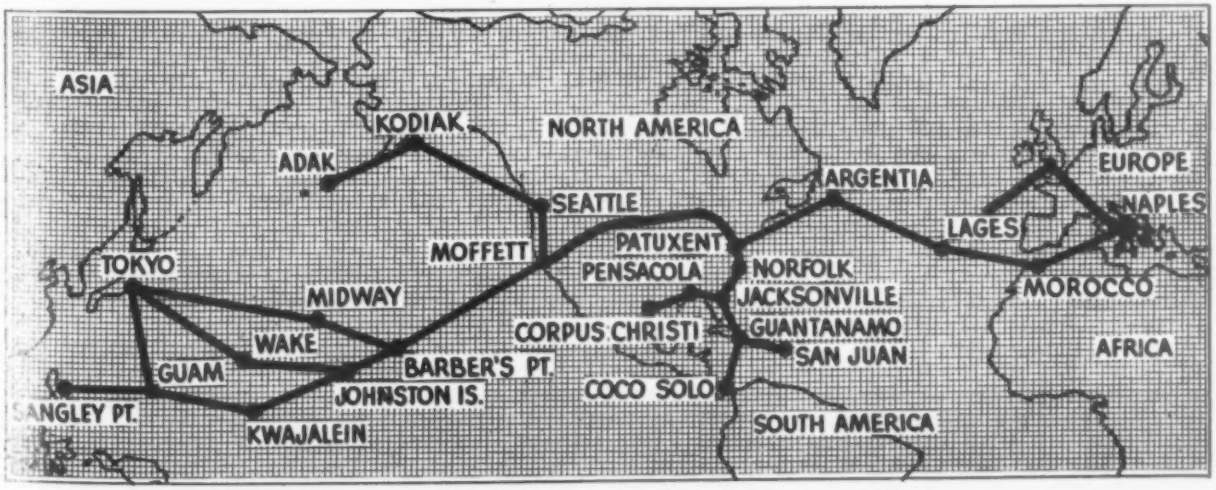
Actually it is not a single organization, but two separate fleet transport wings. It has no overall command, each wing taking its orders from its respective fleet commander.

The two units which comprise FLAW are Fleet Logistic Air Wing Atlantic/Continental (FLOGWINGLANT/CONTL) and Fleet Logistic Air Wing Pacific (FLOGWINGPAC). The former is commanded by Capt. J. I. Taylor, with headquarters at Naval Air Station Patuxent, Md. The latter, commanded by Capt. C. A. Bond, has headquarters at Naval Air Station Alameda, Calif.

The wings operate several different types of aircraft, but, as in MATS, the basic airplane is still the Douglas R5D (Air Force C-54). Other landplane types include the aforementioned R6D and R7V, the R4D (Douglas DC-3) and the Martin TBM.

Two types went out of service in the past year—the Curtiss R5C (C-46) and the two Lockheed R6V Constitutions, heavy transports which have been placed in storage because of the difficulty of maintaining spare parts for only two aircraft.

Water-based types include the Martin PBM Mariner and the huge Martin JRM Mars flying boats, four of which are in service with the Pacific wing. No R3Y deliveries have been made as yet. • • •




TRANSCONTINENTAL ROUTE was established during 1952 in the U.S.

# OSHKOSH

## WHY BROOME COUNTY AIRPORT RELIES ON DEPENDABLE

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Why don't you write for full details of why Oshkosh trucks—for over 35 years—have been unequalled for power, traction, construction, dependable performance with low maintenance cost. Write today—or ask any user!

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OSHKOSH MOTOR TRUCK INC.
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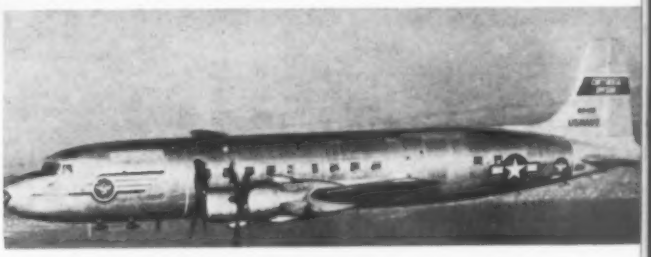
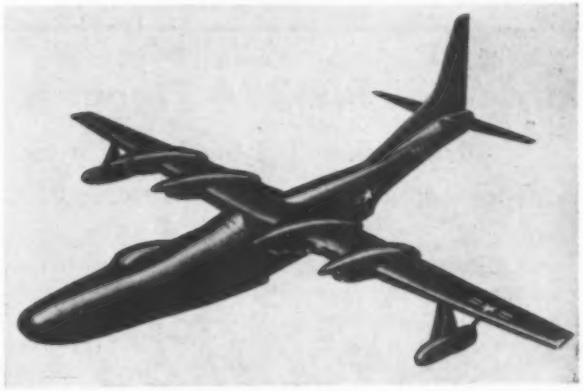
**Martin Mars** is Navy's biggest flying boat and is in regular transport service. It is powered by four Pratt & Whitney R-4360 engines.



**Douglas's DC-6** is known as R6D in Navy service and C-118 in USAF service. Plane is powered by four Pratt & Whitney R-2800 engines rated at 2500 horsepower each. Military has placed sizeable production orders for this type transport.

# Military Transports

**Convair's R3Y-1** is the Navy's first turboprop-powered flying boat and introduces many new design concepts to flying boats which boost performance to favorable comparison with landplanes. Engines are Allison 5500 horsepower T-40's.



**Lockheed's R7V-1** is military version of Super Constellation with Wright R-3350 Turbo-Compound engines rated at 3500 horsepower each. Turboprop-powered version, powered by four Pratt & Whitney T-34's, is now in the prototype stage.

**Douglas's R4D8** is Navy's version of the Super DC-3. Navy ordered 100 of these conversions to stretched-fuselage, higher powered DC-3's. Engines are 1500 horsepower versions of the Wright R-1820.

**Convair's T-29** is USAF version of Convair 240 used for navigation and bombardier training. Four versions of the Convair-Liner have been ordered by USAF, including one designated C-131 which is the newer Convair 340. P & W R-2800 engines, rated at 2500 horsepower each, are used, but Air Force may install Allison T-56 turboprop in at least one ship for evaluation.

## RAPID WRITE-OFFS

| Carrier | Aircraft Involved | Total Amount Approved |
|---|---|---|
| American Airlines | 25 DC-7's | |
| | 25 DC-6B's | |
| | 3 DC-6A's | |
| | 5 Convair 240's | $80.6 million |
| Braniff Airways | 20 Convair 340's | |
| | 3 DC-6's | $11.6 million |
| Capital Airlines | 7 L-749's | $6.7 million |
| | 5 L-049's | $4.2 million |
| Chicago & Southern Air Lines | 5 L-649's | |
| | 1 L-749 | |
| | 10 Convair 340's | $10.7 million |
| Continental Air Lines | 7 Convair 340's | |
| | 2 DC-6B's | $5.0 million |
| Delta Air Lines | 4 DC-7's | |
| | 10 Convair 340's | |
| | 1 DC-6 | $13.9 million |
| Eastern Air Lines | 30 L-1049's | |
| | 60 4-0-4's | $76.0 million |
| Flying Tiger Line | 7 DC-6A's | $9.1 million |
| National Airlines | 4 DC-6's | |
| | 8 DC-6B's | |
| | 4 DC-7's | |
| | 8 Convair 340's | $23.9 million |
| Seaboard & Western Airlines | 4 L-1049B's | $9.5 million |
| Trans World Airlines | 26 L-749A's | |
| | 10 L-1049's | |
| | 40 4-0-4's | $62.0 million |
| United Air Lines | 25 DC-7's | $56.7 million |
| Western Air Lines | 5 DC-6B's | $6.2 million |
| TOTALS | 359 | $376.1 million |

# Carriers Ready 294 Planes for CRAF

### Modifications put under way by airlines as DATA begins its semi-annual review of reserve fleet.

SOME of the airlines which will have to contribute a total of 294 four-engine transports for use by the Military Air Transport Service in case of emergency have begun modifying their aircraft after receiving letters of intent from the USAF.

In the meanwhile, the military and the Commerce Department's Defense Air Transportation Administration, now headed by Tod Hardeen, Jr., are making their semi-annual review of the planes and airlines involved in the Civil Reserve Air Fleet program to determine what changes, if any, are required. The revised CRAF plan is expected to be released by DATA in the near future.

As it stands now, however, MATS would be able to put its hands on 115 DC-4's, 23 DC-6's, 14 DC-6A's, 49 DC-6B's, 22 L-049's, 47 L-649's and L-749's, and 24 B-377's within 48 hours in case of a full-scale war.

Still not completely decided is the question of whether the planes and their crews would be made an integral part of MATS, with the pilots and other crewmen wearing USAF and Navy uniforms, or whether the same contractual relationship now in effect on the Korean air lift would be expanded.

While the 294 transports involved are less than twice the 158 turned over for military use during World War II, they are expected to provide eight times the lift capacity. Although most of the planes will be provided by scheduled carriers, the current program also involves the use of corporate and non-scheduled aircraft.

Following is the CRAF plan as currently listed, including the airline involved and the equipment it will furnish to MATS:

| Carrier | Total |
|---|---|
| Alaska Airlines—2 DC-4's | 2 |
| American Airlines—14 DC-4's, 7 DC-6's, 3 DC-6A's, 18 DC-6B's | 42 |
| Aramco—1 DC-4, 2 DC-6B's | 3 |
| Braniff—4 DC-4's, 5 DC-6's | 9 |
| California Aircraft Co.—1 DC-4 (leased to Hemisphere) | 1 |
| California Eastern—2 DC-4's | 2 |
| California Hawaiian—1 Constellation | 1 |
| Capital—2 DC-4's, 10 Constellations | 12 |
| Carmas Trading Co.—1 DC-4 (leased to Cal Eastern) | 1 |
| Chicago & Southern—3 Constellations | 3 |
| Delta—5 DC-4's | 5 |
| Eastern—11 DC-4's, 18 Constellations | 29 |
| Flying Tigers—2 DC-4's, 5 DC-6A's | 7 |
| National—6 DC-4's, 4 DC-6B's | 10 |
| Northwest—6 DC-4's, 3 B-377's | 9 |
| Ocean Air Tradeways—4 DC-4's (leased to U. S. Overseas) | 4 |
| Pacific Northern—1 DC-4 | 1 |
| Panagra—4 DC-4's, 1 DC-6B | 5 |
| Pan American—19 DC-4's 15 B-377's | 34 |
| Seaboard & Western—5 DC-4's | 5 |
| Slick—5 DC-6A's | 5 |
| Trans Caribbean—3 DC-4's (2 leased to Cal Eastern, 1 to Transocean) | 3 |
| Transocean—3 DC-4's, 1 DC-6A | 4 |
| TWA—11 DC-4's, 37 Constellations | 48 |
| Twentieth Century Aircraft—1 DC-4 (leased to North American Airlines) | 1 |
| United—5 DC-4's, 11 DC-6's, 19 DC-6B's, 6 B-377's | 41 |
| U. S. Overseas—1 DC-4 | 1 |
| Western Air Lines—5 DC-6B's | 5 |
| Western Sky Industries—1 DC-4 (leased to Transocean) | 1 |
| TOTAL | 294 |

The Government's certificate of necessity program for new transports, permitting carriers to amortize most of the cost of their new planes in five rather than seven years for tax purposes, is now well past the half-way mark. The goal is 600 postwar airliners and 359 have been approved by the Office of Defense Mobilization so far on recommendation of the Commerce Department's Defense Air Transportation Administration.

Under the original program, the 600 planes had to be delivered sometime betwen April 1, 1951, and December 31, 1954. But ODM recently extended the dates to January 1, 1950, and June 30, 1955, meaning that more airlines and more airliners became eligible under the rapid tax write-off program.

• • •

## Milestone

**Aeronautical Division established in office of Chief Signal Officer, U. S. Army, marking beginning of Army Air Force.**

**July 1907**

## Milestones

**In the first American test of the practicability of moving a complete troop unit by air, a battalion of 65th Coast Artillery was transported 500 miles by the 7th Bombardment Group, Hamilton Field, Calif.**

**January 23, 1940**

**Air Force C-54 lands near London after completing the 1st trans-Atlantic, robot controlled flight.**

**September 22, 1947**

Air Transport
Facts and Figures
PROGRESS
50TH ANNIVERSARY OF POWERED FLIGHT
SECURITY
14th Edition, 1953

# Scheduled Airlines Celebrate 50th Anniversary of Powered Flight

Few events in history have had greater significance in their impact on the social and economic development of the human race than the flight which took place at Kitty Hawk, N. C., on December 17, 1903.

On that day, a 12-horsepower biplane built by Wilbur and Orville Wright rose from the sands and remained airborne for 12 seconds. Weighing 750 pounds, including fuel and Orville, the Wright plane traveled 120 feet.

Today, a single plane in the U. S. scheduled air fleet is capable of carrying 50 times the weight of the Wright plane and of flying non-stop from 12 to 15 hours. It covers about 4,488 feet in 12 seconds, or more than 37 times the distance flown by the Wright plane.

The U. S. commercial airlines in scheduled domestic and international service have about 1,250 planes, of which more than one-half are four-engined, and are flying 236,000 route miles. These airlines are offering more lift capacity than the rest of the world's air carriers combined.

The factors which have made the United States pre-eminent in aviation are noteworthy.

First, we have the Wright Brothers and other pioneers whose vision and courage resulted in the development of powered, controlled flight. Their discovery was basic to the airlines.

Then, there were the pilot-veterans of World War I and the happy-go-lucky barnstormers of the post-war aerial circus days. They were the men who flew the pioneering planes and who supported the Post Office Department's slogan: "The mail must go through." It was this concept of expediting the mail that did as much as anything else to develop the airlines.

From 1918 to 1926, flying the mail was operated by the Government. Having demonstrated the feasibility of this service, the Post Office turned airmail operations over to private contractors.

Under the impetus of private enterprise, the embryos of the airlines we know today took form. The big job of the day was to deliver the mail in the shortest possible time. The letter that took 32 hours to get from coast to coast at a cost of 35 cents an ounce in 1926, today takes 10 hours and costs 6 cents an ounce.

To regulate and promote the scheduled airlines in the public interest, the Civil Aeronautics Act was passed in 1938. Under this new directive, the scheduled airlines moved forward. Year by year, passengers contributed an increasing portion of the airlines' total revenues, and cargo was being developed as a new phase of airline business. It appeared that the courage and perseverance of the pioneers were about to pay off. Then came Pearl Harbor.

On the day Pearl Harbor was attacked, the military turned to the airlines for help. Their response was immediate. Approximately half their fleet, consisting of 359 twin-engine transports and 27 four-engine flying boats, was turned over to the military for logistic war operations throughout the world. One-half of their personnel (including 1,200 experienced pilots and some 6,000 mechanics and technicians) and about 100 top airline officials went to work for the military.

World War II was a convincing demonstration of the role of commercial air transportation in national defense and global war.

With new equipment and first-rate management, the scheduled airlines entered the Fifties with flying colors. The 1950 picture was one of record passenger, mail and cargo traffic, carried out over a rounded-out system more efficiently and dependably than ever before in the scheduled airlines' history.

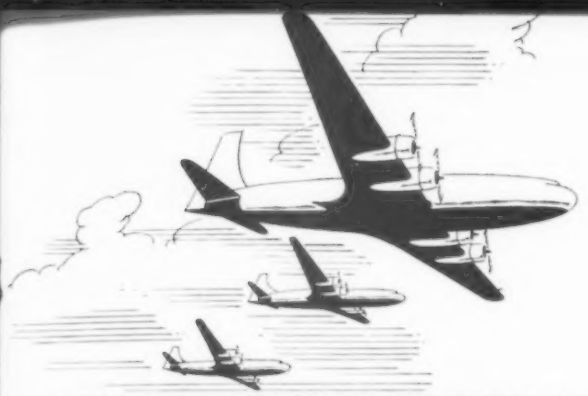
However, once again, as in 1941, there were war rumblings—and once again the airlines were called to the colors. Since the hostilities in Korea began, the scheduled airlines have provided the Military Air Transport Service (MATS) with as many as 40 of their long-range four-engine equipment for the purpose of speeding men and essential supplies to Korea and of evacuating civilians, military and wounded. This contribution to the Pacific Airlift has enabled MATS to meet its logistic commitments in other parts of the world—to meet the threats to the security of the Western World.

Concurrent with their military role, the scheduled airlines are bringing more passenger, mail and cargo (express and freight) to more of the country than ever before; they are bringing this service direct to 687 U. S. Cities, to say nothing of the thousands of towns, villages and rural communities which stand to benefit from the transport facilities enjoyed by the larger urban areas.

In the best tradition of national enterprise, the first 50 years of powered flight have seen a new industry come of age. The future should see commercial air transport becoming even more useful, more productive and a more important force in the life of people everywhere.

*Emory S. Land* President

*Air Transport Association of America*



The U. S. domestic and international scheduled airlines made traffic gains in 1952 which set new records. They carried 28,381,801 passengers—equivalent to nearly one-sixth of the population of the U. S.—15,548,247,000 passenger miles, a gain of 11.0 percent in passengers and 18.1 percent in passenger mileage over 1951. During June, 1952, for the first time in their history, the 14 domestic trunk airlines carried more than 2 million passengers and flew more than 1 billion passenger miles in a single month. This achievement was repeated in July, August, September and October of 1952. It was a year when the domestic scheduled airlines accounted for about 55 percent of the first class travel market. They flew more than 12 billion passenger-miles as against about 10 billion for rail Pullman travel. Compare this with 1932, when airlines passenger traffic was only a little more than one percent of Pullman passenger traffic.

More mail was flown during 1952 than during any other year in the history of scheduled air transport. The mail carried in 1926, the year this service was first provided by private contractors, totaled about 270,000 pounds. In 1952, the scheduled airlines flew approximately 171,000,000 pounds—a volume representing a monthly average of more than 50 times the amount flown during all of 1926.

In 1941, the freight-carrying possibilities of the airlines became apparent, though commercial development at that time was interrupted by World War II. By 1950, the scheduled domestic airlines were flying about 2½ times as many freight ton-miles in one week as they flew during all of 1942. The speed of air freight has been a great boon to importers and exporters, manufacturers and merchandisers, as well as to the public.

The combined express and freight flown by the scheduled airlines during 1952 totaled 233,447,076 ton-miles. This amounted to a 8.6 percent gain above the previous year.

## *Scheduled Air Coach or Tourist Service*

Domestic air coach or tourist service is becoming increasingly a part of the U. S. flying picture. Introduced by the scheduled airlines in 1948, this type of service carried 352,804 passengers close to a quarter of a million passenger miles in 1949—its first full year of operation. During 1952, the scheduled domestic airlines flew 2,309,238,000 air coach passenger miles, a gain of more than 81 percent over the previous year.

Domestic coach travel jumped from 12 percent of total trunk passenger business to 19 percent in 1952. It is forecast that there will be, at a minimum, a 10 percent gain in domestic coach during 1953 over 1952.

International air coach or tourist travel has been a great boon to the international air travel picture. The heaviest international air bookings in airline history characterized the summer of 1952—the first summer season of coach travel abroad. The record shows that a 50 percent increase in trans-Atlantic passenger traffic was made during the first three and one-half months of the new international air tourist rates, which are 30 percent below present first-class fares: May 1—August 15, 1952 registered 73,000 trans-Atlantic passengers as against 50,000 during the same period in 1951.

At the present time, U. S. international flag airlines are carrying 35 percent of all trans-Atlantic passenger traffic.

## *The World By Air*

In 1952, more than 1,300,000 international passengers arrived at or departed from U. S. airports via the commercial airlines of the world. This represents an increase of about 150,000 passengers above the previous year, and is over 300,000 more passengers than were carried by the steamship lines in 1952.

U. S. international airlines accounted for the lion's share of trans-Atlantic air traffic by transporting more than 400,000 persons to and from Europe, Africa and to points beyond. In addition, they carried in excess of 500,000 passengers—

more than the 1950 population of New Orleans—between the U. S. and neighboring Latin American countries—more than double the number flying under the flags of other nations.

The average passenger using the U. S. scheduled airlines for travel from the United States to points outside the continental limits traveled 1,430 miles, and spent an average of just 6 hours time actually in the air.

Those passengers who availed themselves of U. S. scheduled trans-Atlantic service only averaged flights of 2,362 miles each way and spent only 18 hours and 40 minutes in the air for the round trip.

This time saving enables business men to transact on-the-spot negotiations which would be impossible otherwise and opens new vistas for vacationers who never before could afford the time away from work.

The impact of international travel in 1952 was felt most at the Port of New York, where there were 28,600 international airplane arrivals and departures during the year. These flights arrived at or departed from New York 75 times a day (24 hours) for an average of over three arrivals or departures every hour.

## *Local Service Airlines*

Following the pattern of the scheduled domestic airlines, the local service airlines in 1952 showed gains in all services except express, which was down 5.7 percent. However, this was more than offset by the gain in local service freight operations, where 1,116,583 freight ton-miles were carried. This represented a gain of 21.3 percent over 1951.

Passenger-miles totaled 339,763,000, an increase of 17.3 percent over 1951. Mail ton-miles scored a new high of 911,863, up more than 6.3 percent above the previous year.

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# FINANCES

The scheduled airlines for the first time in their history, became a billion-dollar industry in 1952. Operating revenues were in excess of $1,120,000,000, a 13.8 percent increase over 1951.

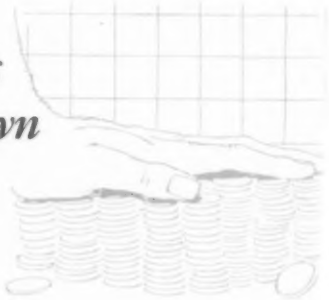
During 1952, passengers accounted for about 80 percent of the industry's revenues (77 percent of the ton-mileage flown), substantially exceeding that of mail and freight. While airmail ton-miles showed an increase, payment received by the carriers from the Post Office experienced a decrease. Total domestic and international mail revenues for the scheduled airlines in 1952 amounted to $115,215,000 as against $118,257,000 in 1951, representing a decrease in 1952 of 2.6 percent below the previous year. This was due to the non-subsidy mail rates (payments for services rendered only) received by 11 out of 16 trunk lines, decreased payments to international carriers, and smaller subsidy payments to the rest of the industry.

## *Subsidy On The Way Out*

Today, *more than 98 percent* of all mail carried by the domestic scheduled airlines is free of airmail subsidy from the Government.

Due to lower Post Office payments for carrying the mail, the scheduled domestic trunk airlines received 21 per cent less pay for carrying 48½ percent more mail in 1952 than in 1950.

## *Air Lines Keep Down Their Fares*



A regular fare flight from New York to Chicago in 1939 required four hours and thirty-five minutes and cost $44.95. Today

between the same points, air tourist service, which is higher in quality than regular service was 14 years ago, takes three hours and 15 minutes and costs $33.00. This does not take into consideration the depreciation of the dollar since 1939.

For example, in terms of the 1939 dollar, domestic trunkline passenger transportation is 40 percent less than it was 14 years ago—*or less than 3c a mile.*

By comparison with rail and bus fares, and in view of the general increase in labor, equipment and operation costs, the scheduled airlines' ability to keep down their fares is noteworthy.

The scheduled airlines have been conscientious in carrying out the Government mandate to bring to the public the utmost in flying safety. In 1952, this continuing accent on safety resulted in the best safety record ever achieved by the U. S. scheduled domestic air carriers: 0.38 fatalities per 100 million passenger miles. This compares favorably with 1.3 in 1951 and 1.1 in 1950, the previous record year.

Averaging a landing or takeoff every 7 seconds, or approximately 13,000 per day, the domestic scheduled airlines completed a full 12 months of operations without a single fatality on February 11, 1953. During that period, they flew 150,000,000 revenue passenger miles, which is equivalent to one passenger making 2,548,449 round trips between New York and San Francisco.

In each month during which this safety record was being made, the scheduled domestic airlines flew more passengers and more passenger-miles than they did during the entire year 1938—the year which saw the passage of the Civil Aeronautics Act. In fact, during each of the months of August, September and October of 1952, the domestic scheduled passenger-miles flown were double those flown during the year 1938.

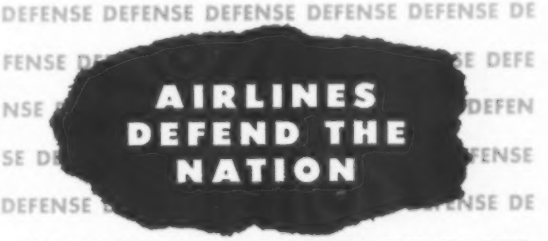
Without sacrifice of safety, the scheduled airlines continued their efforts to reduce aircraft noise during 1952. To alleviate the noise level in areas adjacent to airports, aircraft run-up activities have been relocated where the noise generated will cause the least amount of disturbance. Blast-deflectors have been built around those areas to divert the noise skyward. In some instances, it has been possible to use existing buildings and structures on the airport as baffles.

Advances in aircraft design, faster and heavier planes, and heavier wing loadings make it possible to use runways leading away from congested areas in reasonable crosswinds, without relaxing the airlines' high safety standards. Moreover, flight patterns are being altered to avoid residential areas insofar as the best interests of safety will permit.

To give top policy consideration to the noise and related problems at the National Level, there exists the National Aviation Noise Reduction Committee. This committee has been created as a cooperative effort of all segments of aviation to meet the community problems caused by the volume of the Nation's air traffic.

Among the steps taken to make the airports of the United States good neighbors is the Report of the President's Airport Commission, generally known as the Doolittle Report, published in May of 1952. The recommendations there made are long-range and require the cooperation of the community with forces of aviation impinging upon it. These forces include the airlines, the pilots, the aircraft manufacturers and the government agencies concerned with the regulation of the aviation industry.

Those groups believe that their continuing efforts will persuade members of the American community to tolerate some noise as a part of the cost of living in this age of technology.




Current mobilization planning includes the use of the airlines to supplement military transportation while continuing their support of the Nation's commerce. Under

this planning, the airlines stand ready to contribute to the security of the Nation more than four times as many ton-miles of lift capacity as they contributed at the time of Pearl Harbor, without serious disruption to normal civilian peacetime traffic. This military/civilian role is made possible by the greater utilization and greater lift capacity of present-day four-engined aircraft than provided by the aircraft available at the beginning of World War II.

The Civil Reserve Air Fleet Program agreed to by the Commerce and Defense Departments earmarks 294 four-engine airliners for transfer to overseas operations under contract to the Military Air Transport Service (MATS) on 48 hours' notice. The airlines will provide these airplanes with their skilled crews.

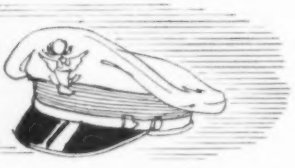
This contribution to the national security would cost the military about $348,000,000, plus the additional millions represented by hangars, spare parts and trained "know-how."

About half of the airlines have already contracted with the Air Materiel Command to start at least part of the proposed modification. If necessary, the airlines will contribute more equipment, including skilled personnel.

In full mobilization, according to present planning, the airlines would still be able to fly more commercial traffic than they do at present, despite turning over to the military one-third of their fleet. This can be done because their aircraft utilization and resulting heavy load factors would increase more than the fleet size decreased.

The year 1953 will see the Nation able to look for even greater support from the scheduled airlines. In that year, their lift capacity will be increased by 40 percent above present capacity—that is, the scheduled airlines will be able to fly 9 billion more passenger-miles than the 15 billion passenger miles they flew during 1952.

## *Military Bureau*



The scheduled airlines contribution to the national defense effort is greatly enhanced by the operations of their Military Bureau.

Through this Bureau, the airlines are expediting the movement throughout the Nation, of approximately 60,000 military personnel a month. This kind of activity is winning transportation officers to the view that it is inexpensive, expedient and efficient to move military by air.

The transport of the military by air also serves as a strong morale factor, in that it gets our troops home from their overseas assignments in the shortest possible time.

## INTO THE FUTURE

The Golden Anniversary of Powered Flight is not an occasion for enumerating achievement alone. Wilbur and Orville Wright are revered in aviation today not only for the first controlled powered flight, but for the day-to-day problems they share with later-day Wrights, who face, as they attempt to consolidate the past and project into the future, similar problems. We esteem the Wrights not alone for their achievement, but because they were conservative devotees of the slide-rule, and masters at conquering dull technical detail.

As the proponents of powered flight cross the mid-century mark they, too, must solve the problems in determining the air transportation pattern of the future.

One of the major problems which is currently challenging engineers, manufacturers, the airlines and city planners alike, is turbine-powered or jet aircraft.

The principle of jet propulsion is understood, accepted, and now the task is to use it—to make it a practical part of the air transport system of this country.

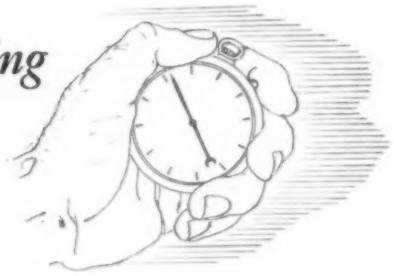
Cost is the chief obstacle between jet and the U. S. commercial airlines. The high rate of fuel consumption makes jet operation very expensive. The jet is most efficient when it can climb high—to altitudes from 30,000 to 40,000 feet—and cruise over a long distance. Hence, on short hops such as between New York and Washington, a jet airliner would no sooner be up than it would have to come down. And even on long non-stop flights, the rate of fuel consumption is so high at the present time that no jet aircraft has yet been built capable of carrying sufficient payloads to make its operation economically sound. However, the future will see this problem overcome.

Just as the great speed of the jet makes this type of aircraft most effective in long trans-continental and trans-oceanic flights, so it is becoming more and more apparent that traffic demands of the Nation will require the development of a plane designed for short-hauls—a plane more flexible, cheaper to operate, and easier to maintain than any plane presently in short-hop service.

The helicopter appears to offer much hope in meeting these requirements. Helicopter studies, together with limited operations to date, suggest that the helicopter can eventually provide an economical short flight in our scheduled air transport system.

The helicopter's contribution to the war in Korea—in evacuating the wounded from battle areas and in general reconnaissance—has cut at least ten years off the helicopter industry's anticipated time schedule for development and recognition. Korea has in fact brought about an awareness of the potential of the helicopter both to the military and to commercial air transport interests, to say nothing of the implications it holds for private flying.

## *Improving Service to the Public*



The advent of jets and helicopters gives great promise of providing means by which the airlines can continue improvement of their long-and-short-haul operations. The airlines regard themselves as obligated under their certificate from the Government to explore fully any possibility of improving their services to the public through the use of new type aircraft which can be used effectively for such purposes.

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## AIRPOWER . . . A DEFINITION

Airpower includes not only th military strength aloft, but also the peace- e strength of the airlines. Airpower is the acity of industry to apply the discoveries of nce; it is the skill of mechanics and artisans; the exploitation of resources for improved s, metals and power plants; it is the train- of youth to be at home in the medium of air; the sum total of all these things, which, ured from Kitty Hawk and fostered by pri- enterprise under an enlightened Federal cy, has resulted in the greatest commercial air sport system in the world.

ased on this past, and with the seeds of ex- sion so firmly planted in the present, the re of U. S. air transport is assured.

## SCHEDULED AIR TRANSPORTATION GROWTH

The following pages cover the growth of the U. S. scheduled airlines from the beginning of World War II to the present. This year the statistical tables have been revamped in order to depict more effectively the ever-growing importance of safe, fast and economical air transportation to U. S. trade, travel and the national security. The records of the Civil Aeronautics Board, the Civil Aeronautics Administration and the Interstate Commerce Commission served as the source of the statistics here shown.


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# CLASSES OF COMMERCIAL AIR CARRIERS IN THE UNITED STATES

As of 1953, seven principal classes of commercial air carriers could be recognized in the air transport industry of the United States. This classification is largely based upon scope of operations authorized or allowed by the Civil Aeronautics Board under the Civil Aeronautics Act.

**1.** *The Domestic Trunk Lines* include those air carriers, whose operating rights within the continental United States, to a large degree, derive from operations by present or predecessor companies. These companies antedate the Civil Aeronautics Act of 1938, thus according them "grandfather rights". Currently there are fourteen such companies, most of which have high-density traffic routes between the larger traffic centers within the United States. These companies as now constituted are:

| | | |
|---|---|---|
| American | Continental | Northwest |
| Braniff | Delta | Trans World |
| Capital | Eastern | United |
| Chicago & Southern | National | Western |
| Colonial | Northeast | |

**2.** *Domestic Local Service Lines,* with one exception, have appeared since 1945. and are operating under temporary, limited period certificates. They operate the low density traffic routes between the smaller traffic centers, and between such and some larger centers.

| | | |
|---|---|---|
| Allegheny | Mohawk | Southern |
| Bonanza | North Central | Southwest |
| Braniff | Ozark | Trans Texas |
| Central | Piedmont | West Coast |
| Frontier | Pioneer | Wiggins |
| Lake Central | | |

**3.** *International and Overseas* group includes all U. S. Flag Air Carriers authorized to operate between the United States and foreign countries, between foreign countries, plus the extension of certain domestic trunk lines into Mexico and the Caribbean.

| | | |
|---|---|---|
| American | Colonial | Pan American |
| Braniff | Eastern | Pan American-Grace |
| Caribbean Atlantic | National | Trans World |
| Chicago & Southern | Northwest | United |

**4.** *Territorial Air Carriers* presently include only two certificated lines operating in Hawaii. Alaskan carriers are separately designated as such.

| | |
|---|---|
| Hawaiian | Trans-Pacific |

**5.** *Certificated All Cargo Lines* include operators holding special certificates to maintain scheduled cargo flights between designated areas in the United States. They carry neither mail nor passengers.

| | |
|---|---|
| Slick | Riddle |
| Flying Tigers | U. S. Airlines |

**6.** *Helicopter Airmail Operators* presently include three carriers certificated to carry mail between airports, central post-offices, and suburbs in New York, Chicago and Los Angeles. Freight service on the same route has been inaugurated in New York.

| | | |
|---|---|---|
| Helicopter Air Service | Los Angeles Airways | New York Airways |

**7.** *Non Certificated Air Carriers* include a diversified group of operators, who are described in the CAB 1952 Annual Report as follows:

Operators of various types of air service were authorized by the Board through the exemption process, rather than through the requirement that a certificate of public convenience and necessity be obtained. At present this group includes:

| | |
|---|---|
| Large irregulars | 47[1] |
| Irregular transport carriers | 17 |
| Air taxi operators | 1,442 |
| Non-certificated cargo carriers | 3 |
| Alaskan pilot-owners | 97 |
| Non-certificated Alaskan air carriers | 8 |
| Air freight forwarders | 39 |

[1] One large irregular was awarded a certificate of public convenience and necessity.

Statistics in this publication are for the first four classes of carriers only. All statistics are from official reports or publications of the Civil Aeronautics Board, Civil Aeronautics Administration, Post Office and Interstate Commerce Commission.

SERVICE TO DOMESTIC ROUTES AND CITIES CERTIFICATED BY THE C.A.B. TO TRUNK AND LOCAL SERVICE AIRLINES

| Year | Duplicated Route Miles [1] | Average Route Miles Operated [2] | Cities Authorized for Service [3] | Cities Actually Served [3] |
|---|---|---|---|---|
| 1941 | 43,411 | 42,757 | n.a. | n.a. |
| 1942 | 44,623 | 41,596 | n.a. | n.a. |
| 1943 | 45,304 | 42,537 | n.a. | n.a. |
| 1944 | 49,482 | 47,384 | 401 | 237 |
| 1945 | 51,433 | 47,960 | 405 | 287 |
| 1946 | 77,175 | 52,745 | 580 | 477 |
| 1947 | 114,910 | 60,870 | 663 | 479 |
| 1948 | 138,501 | 68,111 | 745 | 521 |
| 1949 | 142,429 | 71,879 | 793 | 525 |
| 1950 | 147,135 | 76,686 | 798 | 580 |
| 1951 | 162,353 | 76,383 | 790 | 580 |
| 1952 | 162,125 | 77,617 | 761 | 584 |

## BREAKDOWN OF CITIES AUTHORIZED FOR SERVICE December 31, 1952

| | Cities Served | Cities Not Served | Total |
|---|---|---|---|
| Trunk Lines exclusively | 197 | 33 | 230 |
| Local Service Airlines, exclusively | 199 | 140 | 339 |
| Combination Trunk and Local Service | 188 | 4 | 192 |
| *Total* | 584 | 177 | 761 |

n.a.—not available

[1] The traditional measure of route mileage has been the miles of air-mail routes in the airlines' certificates. Since a given pair of cities, like Boston and New York, may occur in several mail routes of a single carrier, there is a substantial duplication in using the consolidated mileage of mail routes as system mileage. However, these are the only certificated mileage figures available for prior years. The data are as of December 31st of each year.

[2] These figures represent the average number of *unduplicated* route miles over which individual airlines actually operated in the last Quarter of each year. This is calculated by the Civil Aeronautics Board.

[3] Many cities are authorized for air service in certificates given to the airlines by the CAB which may not have adequate airports or airways facilities. As these deficiencies are corrected, service is inaugurated. All figures are for December 31st of each year.

# PLANES IN SERVICE AND AVAILABLE CAPACITIES OF THE U. S. CERTIFICATED AIRLINES 1941-1952

| Year | Number of Planes In Service [4] | Available Seat Miles Flown (000) | Available Ton Miles Flown (000) | Revenue Plane Miles Flown (000) |
|---|---|---|---|---|
| **Domestic Trunk Lines** | | | | |
| 1941 | 259 | 2,341,877 | n.a.[2] | 134,406 |
| 1942 | 186 | 1,962,588 | n.a. | 111,341 |
| 1943 | 204 | 1,856,954 | n.a. | 105,354 |
| 1944 | 288 | 2,436,846 | n.a. | 138,732 |
| 1945 | 402 | 3,815,573 | n.a. | 205,934 |
| 1946 | 638 | 7,556,469 | 982,169 | 306,236 |
| 1947 | 748 | 9,152,389 | 1,202,535 | 311,879 |
| 1948 | 790 | 9,980,163 | 1,352,863 | 316,276 |
| 1949 | 784 | 11,117,703 | 1,505,330 | 323,241 |
| 1950 | 796 | 12,385,635 | 1,662,903 | 327,054 |
| 1951 | 804 | 14,671,982 | 1,959,497 | 362,473 |
| 1952 | 903 | 18,068,123 | 2,384,245 | 411,424 |
| **Local Service Airlines** | | | | |
| 1945 | 12 | 2,486 | n.a. | 1,771 |
| 1946 | 23 | 17,964 | 1,762 | 3,041 |
| 1947 | 46 | 155,507 | 14,880 | 10,103 |
| 1948 | 68 | 323,942 | 31,442 | 18,321 |
| 1949 | 82 | 477,895 | 46,260 | 24,946 |
| 1950 | 137 | 599,159 | 61,587 | 33,690 |
| 1951 | 130 | 774,912 | 78,985 | 38,603 |
| 1952 | 131 | 904,908 | 94,804 | 41,143 |
| **Territorial Airlines** [1] | | | | |
| 1945 | 7 | 28,555 | n.a.[2] | 1,663 |
| 1946 | 11 | 48,188 | 6,067 | 2,423 |
| 1947 | 13 | 65,865 | 8,026 | 3,073 |
| 1948 | 15 | 80,978 | 9,024 | 3,620 |
| 1949 | 15 | 95,056 | 10,278 | 4,127 |
| 1950 | 21 | 100,148 | 10,419 | 4,272 |
| 1951 | 21 | 119,049 | 13,143 | 5,029 |
| 1952 | 22 | 124,060 | 13,639 | 5,366 |
| **International Airlines** [3] | | | | |
| 1941 | 83 | 248,331 | n.a.[2] | n.a.[2] |
| 1942 | 68 | 313,109 | n.a. | n.a. |
| 1943 | 70 | 307,513 | n.a. | n.a. |
| 1944 | 70 | 391,293 | n.a. | n.a. |
| 1945 | 97 | 583,440 | n.a. | n.a. |
| 1946 | 147 | 1,553,691 | 211,694 | 59,376 |
| 1947 | 313 | 2,924,335 | 418,356 | 86,48[illegible] |
| 1948 | 323 | 3,292,319 | 468,842 | 98,05[illegible] |
| 1949 | 379 | 3,624,673 | 534,853 | 104,52[illegible] |
| 1950 | 373 | 3,695,447 | 554,940 | 93,83[illegible] |
| 1951 | 379 | 4,334,498 | 599,340 | 97,52[illegible] |
| 1952 | 388 | 4,848,829 | 682,670 | 103,39[illegible] |

[1] Territorial airlines included with domestic trunk prior to 1945.

[2] Not available as data were not required by CAB prior to 1946.

[3] The following aircraft, operated in both foreign and domestic trunk service, are listed in international as well as domestic: 1946—16; 194[illegible]—148; 1948—156; 1949—193; 1950—210; 1951—233; 1952—235.

[4] All data for planes are as of December 31st of the year.

## AIRPLANES OPERATED BY U. S. DOMESTIC AND INTERNATIONAL AIRLINES

in Selected Years

All figures as of December 31st

| Type of Aircraft | No. of Engines | 1941 Domestic | 1941 International | 1946 [1] Domestic | 1946 [1] International | 1951 [1] Domestic | 1951 [1] International | 1952 [1] Domestic | 1952 [1] International |
|---|---|---|---|---|---|---|---|---|---|
| Boeing | | | | | | | | | |
| 247-D | 2 | 28 | 1 | 4 | — | — | — | — | — |
| 307-B | 4 | 5 | 3 | 5 | 3 | — | — | — | — |
| 377 | 4 | — | — | — | — | 10 | 45 | 10 | 44 |
| Convair | | | | | | | | | |
| 240 | 2 | — | — | — | — | 102 | 14 | 99 | 14 |
| 340 | 2 | — | — | — | — | — | — | 25 | 1 |
| Douglas | | | | | | | | | |
| DC-2 | 2 | 13 | 8 | — | — | — | — | — | — |
| DC-3 | 2 | 225 | 38 | 470 | 63 | 425 | 27 | 384 | 26 |
| DST | 2 | 45 | — | — | — | — | — | — | — |
| DC-4 | 4 | — | — | 158 | 50 | 137 | 123 | 124 | 101 |
| DC-6 | 4 | — | — | — | — | 139 | 97 | 161 | 124 |
| Lockheed | | | | | | | | | |
| Electra | 2 | 16 | 9 | 3 | — | — | — | — | — |
| Lodestar | 2 | 13 | 7 | 11 | — | 11 | — | 11 | — |
| Constellation | 4 | — | — | 12 | 31 | 101 | 73 | 125 | 78 |
| Martin | | | | | | | | | |
| 202 | 2 | — | — | — | — | 12 | — | 21 | — |
| 404 | 2 | — | — | — | — | 18 | — | 96 | — |
| Sikorsky | 2 | 5 | 17 | — | — | — | — | — | — |
| Stinson | 1 | 9 | — | 10 | — | — | — | — | — |
| *Total* | | 359 | 83 | 673 | 147 | 955 | 379 | 1,056 | 388 |

Domestic, includes Trunk, Local Service and Territorial, for this Table.

[1] Certain domestic trunk lines use the same airplanes on both domestic and international routes. Those airplanes listed in both international and domestic are:

| | 1946 | 1951 | 1952 |
|---|---|---|---|
| Boeing 377 | .. | 10 | 10 |
| DC-4 | 8 | 69 | 55 |
| DC-6 | .. | 91 | 98 |
| Constellation | 8 | 55 | 64 |
| DC-3 | .. | 8 | 8 |

## NEW PLANES ON ORDER

by U. S. Domestic and International Airlines

as of the first quarter of 1953

All planes listed herein were undelivered January 1, 1953 or were ordered between January 1 and April 1, 1953, and scheduled to be delivered within three years. All DC-6s and Convair 340s are scheduled for delivery in 1953.

| Airplane Model | Number [1] | Estimated Cost Each [2] | Total Fleet Cost | Estimated Annual Capacity of new Planes on order Seat Miles (000) [3] |
|---|---|---|---|---|
| Douglas | | | | |
| DC-6A & B | 43 | $1,200,000 | $ 51,600,000 | 2,076,427 |
| DC-7 | 58 | 2,000,000 | 116,000,000 | 3,423,160 |
| Convair | | | | |
| 340 | 89 | 700,000 | 62,300,000 | 1,910,118 |
| deHavilland | | | | |
| Comet III | 3 | 2,000,000 | 6,000,000 | 200,055 |
| Lockheed | | | | |
| Super Constellation | 33 | 1,900,000 | 62,700,000 | 1,682,076 |
| *Totals* | 226 | | $298,600,000 | 9,291,836 |

[1] The numbers for international service only are: DC-6—6; Comet III—3.

[2] The estimated cost of airplanes includes 20% for spare parts.

[3] Available seat miles are calculated on the basis of average number of seats, average block to block speed and 7 hours daily utilization.

## THE FEDERAL AIRWAYS SYSTEM IN SELECTED YEARS

The Federal Airways System is a net work of air spaces 10 miles wide, and of indefinite altitude, constituting routes connecting most cities served by the certificated airlines, and equipped with navigation, communication and traffic control aids. The airways are designated by the Administrator of Civil Aeronautics at such time as they are completely equipped.

| | 1941 | 1946 | 1949 | 1952 |
|---|---|---|---|---|
| Mileage of Domestic Airways under Traffic Control | 30,913 | 36,126 | 57,452 | 65,940 mi. |
| Trans Oceanic Routes with Airway Facilities | ..... | 14,703 | 21,257 | 19,358 mi. |
| Domestic Mileage with Very High Frequency Radio Communications and Navigation Aids | ..... | ..... | ..... | 57,304 mi. |
| Mileage of teletype weather reporting circuits | 30,832 | 61,828 | 68,227 | 76,000 mi. |
| *Emergency Landing Fields* [1] | 310 | 255 | 220 | 94 |
| *Lighting Aids* | | | | |
| Airways light beacons [1] | 2,276 | 2,156 | 1,801 | 896 |
| Airport low visibility approach lights | 14 | 32 | 90 | 100 |
| *Radio Navigation Aids* | | | | |
| 4-course ranges, low/medium frequency | 298 | 346 | 336 | 335 |
| Omniranges, very high frequency | ..... | ..... | 368 | 382 [2] |
| Fan Markers, low/medium frequency | 121 | 253 | 288 | 283 |
| Radio Homing Beacons, low/medium frequency | 38 | 76 | 110 | 154 |
| *Electronic Low-visibility Landing Aids* | | | | |
| Instrument Landing System | 1 | 20 | 90 | 119 |
| Precision Approach Radar | ..... | ..... | 3 | 10 |
| *Traffic Control Facilities* | | | | |
| Enroute Traffic Control Centers | 14 | 25 | 27 | 27 |
| Airport Traffic Control Towers | [3] | 99 | 155 | 166 |
| Airport Radar | ..... | ..... | 3 | 10 |
| *Communications Facilities* | | | | |
| Interstate Aviation Communications Stations [1] | 396 | 399 | 421 | 375 |

[1] One of the problems in the development of the Federal Airways System has been the rapid obsolescence caused by technical change. As radio navigation has improved, visual aids such as beacon lights have been dispensed with in many locations. Airport construction has removed the need for most of the emergency landing fields. The change to very high frequency radio aids will eliminate the need for many low/medium frequency facilities and the increased number of control towers will reduce the number of communications stations.

[2] 28 of these ranges have experimental Distance Measuring Equipment installations.

[3] Control Towers were municipally owned prior to 1942.

## NUMBER OF AIRPORTS BY CLASSES

Continental United States 1941-1952

| | 1941 | 1946 | 1947 | 1948 | 1949 | 1950 | 1951 | 1952 [2] |
|---|---|---|---|---|---|---|---|---|
| Class I and Under [1] (Unpaved 1800'-2700', Paved 1800'-2500') | 1,523 | 2,491 | 3,525 | 4,006 | 4,013 | 4,005 | 3,869 | 3,[illegible]35 |
| Class II (Unpaved 2700'-3700', Paved 2500'-3500') | 702 | 758 | [illegible]845 | 972 | 995 | 964 | 993 | [illegible]76 |
| Class III (Unpaved 3700'-4700', Paved 3500'-4500') | 187 | 485 | 422 | 471 | 475 | 507 | 573 | [illegible]71 |
| Class IV (Unpaved 4700'-5700', Paved 4500'-5500') | 72 | 443 | 314 | 361 | 364 | 376 | 455 | [illegible]17 |
| Class V (Unpaved 5700'-6700', Paved 5500'-6500') | ... | 313 | 100 | 131 | 133 | 139 | 182 | [illegible]31 |
| Class VI (Unpaved 6700'-7700', Paved 6500'-7500') | ... | ... | 52 | 7 | 73 | 81 | 164 | [illegible]16 |
| TOTAL | 2,484 | 4,490 | 5,258 | 5,948 | 6,053 | 6,072 | 6,236 | 5,[illegible]6 |

[1] Airport Class is determined by the length and construction of the longest runway.

[2] Military airports are included in this table and numbered 363 in 1952.

## PERSONNEL EMPLOYED BY THE SCHEDULED AIRLINE INDUSTRY 1941-1952

### Domestic Airlines [1]

| Year | Pilots & Co-Pilots | Pursers Stewards Stewardesses | Other Flight Personnel | Meteorologists and Dispatches | Mechanics | Other Hangar and Field Personnel | Ticket Agents and Reservationists | Office Employees | All Others | To |
|---|---|---|---|---|---|---|---|---|---|---|
| 1941 | 2,217 | 1,028 | 19 | 220 | 4,423 | 2,224 | 7,807 | 1,285 | 19,2 | |
| 1942 | 2,194 | 753 | 112 | 1,581 | 9,348 | 2,969 | 7,717 | 2,236 | 26,9 | |
| 1943 | 2,125 | 845 | 8 | 1,685 | 8,271 | 3,356 | 10,973 | 2,391 | 29,6 | |
| 1944 | 2,879 | 1,322 | 11 | 1,870 | 7,136 | 3,509 | 12,201 | 2,270 | 31,1 | |
| 1945 | 4,967 | 2,075 | 108 | 2,613 | 10,844 | 7,012 | 19,241 | 3,453 | 50,3 | |
| 1946 | 5,712 | 3,342 | 98 | 3,577 | 16,107 | 10,307 | 24,626 | 5,413 | 69,1 | |
| 1947 | 5,034 | 3,061 | 181 | 2,618 | 15,366 | 8,409 | 22,012 | 2,317 | 58,9 | |
| 1948 | 5,307 | 3,038 | 312 | 2,612 | 16,428 | 9,222 | 21,396 | 2,101 | 60,4 | |
| 1949 | 5,257 | 3,199 | 642 | 2,497 | 15,674 | 9,336 | 21,136 | 2,145 | 59,8 | |
| 1950 | 5,785 | 3,372 | 776 | 2,450 | 15,788 | 9,822 | 21,894 | 2,016 | 61,9 | |
| 1951 | 6,688 | 4,106 | 1,012 | 2,617 | 18,908 | 11,475 | 25,770 | 2,322 | 72,8 | |
| 1952 [2] | 7,256 | 4,671 | 1,100 | 2,962 | 18,990 | 12,398 | 21,876 | 9,391 | 78,6 | |

### International Airlines

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1941 | 447 | 182 | 30 | .... | 1,966 | 2,707 | 1,903 | .... | 7,2 |
| 1942 | 952 | 378 | 129 | 29 | 3,534 | 4,415 | 3,366 | .... | 12,8 |
| 1943 | 207 | 147 | 322 | 511 | 2,140 | 1,835 | 1,859 | 2,604 | 9,6 |
| 1944 | 466 | 194 | 266 | 631 | 2,827 | 2,239 | 3,033 | 1,753 | 11,4 |
| 1945 | 930 | 411 | 938 | 864 | 5,099 | 2,435 | 4,663 | 2,628 | 17,9 |
| 1946 | 1,508 | 1,079 | 1,405 | 1,454 | 7,269 | 2,463 | 6,961 | 5,233 | 27,3 |
| 1947 | 1,603 | 1,016 | 1,152 | 1,211 | 5,774 | 3,201 | 10,679 | 1,518 | 26,1 |
| 1948 | 1,619 | 1,104 | 1,203 | 1,049 | 5,400 | 2,440 | 9,749 | 1,628 | 24,1 |
| 1949 | 1,586 | 1,142 | 960 | 1,084 | 3,861 | 2,338 | 9,012 | 1,125 | 21,1 |
| 1950 | 1,492 | 1,055 | 745 | 953 | 3,818 | 2,434 | 9,244 | 1,142 | 20,8 |
| 1951 | 1,698 | 1,197 | 696 | 1,001 | 4,569 | 2,895 | 9,311 | 1,488 | 22,8 |
| 1952 [2] | 1,631 | 1,204 | 799 | 982 | 4,410 | 3,257 | 4,695 | 4,494 | 21,4 |

[1] Includes Trunk, local service and territorial lines.

[2] 1952 figures are for September 30. All others are as of December 31.

## REVENUE TRAFFIC CARRIED BY THE SCHEDULED AIRLINES IN SCHEDULED SERVICES 1941-1952

| Year | Revenue Passengers | Revenue Passenger Miles (000) | Passenger Load Factor % | Airmail Ton-Miles | Express Ton-Miles | Freight Ton-Miles [2] | Total Revenue Ton-Miles (000) | Ton-Mile Load Factor |
|---|---|---|---|---|---|---|---|---|
| **Domestic Trunk Airlines** | | | | | | | | |
| 1941 | 3,848,882 | 1,384,733 | 59.13 | 13,168,018 | 5,258,551 | ..... | 158,252 | n.a. |
| 1942 | 3,129,421 | 1,417,526 | 72.21 | 21,166,024 | 11,901,793 | ..... | 177,099 | n.a. |
| 1943 | 3,035,755 | 1,634,135 | 88.00 | 36,068,309 | 15,636,811 | ..... | 218,273 | n.a. |
| 1944 | 4,045,965 | 2,264,495 | 89.38 | 51,145,402 | 17,702,932 | ..... | 289,885 | n.a. |
| 1945 | 6,376,843 | 3,336,278 | 88.16 | 65,003,542 | 20,509,753 | 1,168,534 | 424,652 | n.a. |
| 1946 | 11,889,617 | 5,903,111 | 78.81 | 32,877,905 | 23,651,666 | 14,433,101 | 654,614 | 66.65 |
| 1947 | 12,279,016 | 6,016,257 | 65.73 | 32,879,662 | 28,533,362 | 35,224,221 | 683,360 | 56.83 |
| 1948 | 12,324,038 | 5,822,388 | 58.34 | 37,509,922 | 29,768,883 | 70,437,811 | 703,054 | 51.97 |
| 1949 | 14,021,047 | 6,562,580 | 59.03 | 40,874,188 | 27,329,361 | 94,189,591 | 801,508 | 53.24 |
| 1950 | 15,978,172 | 7,766,008 | 62.70 | 46,314,753 | 36,538,183 | 112,860,631 | 951,475 | 57.22 |
| 1951 | 20,604,927 | 10,210,724 | 69.59 | 62,932,409 | 40,259,510 | 100,581,004 | 1,196,094 | 61.04 |
| 1952 | 22,768,174 | 12,120,789 | 67.08 | 68,296,296 | 40,375,164 | 117,128,101 | 1,404,867 | 58.92 |
| Figures before 1945 include territorial lines | | | | | | | | |
| **Local Service Airlines** | | | | | | | | |
| 1945 | 4,452 | 1,312 | 52.78 | 74,510 | 11,482 | n.a. | 202 | n.a. |
| 1946 | 25,118 | 6,812 | 37.92 | 60,088 | 24,354 | 25 | 688 | 39.05 |
| 1947 | 235,585 | 46,418 | 29.85 | 167,564 | 117,523 | 62,039 | 4,682 | 31.47 |
| 1948 | 425,685 | 87,928 | 27.14 | 361,984 | 189,550 | 264,794 | 9,040 | 28.75 |
| 1949 | 677,817 | 134,691 | 28.18 | 473,749 | 320,187 | 435,558 | 14,197 | 30.69 |
| 1950 | 969,428 | 188,782 | 31.51 | 629,006 | 622,819 | 695,844 | 20,307 | 32.97 |
| 1951 | 1,480,524 | 289,616 | 37.37 | 857,422 | 908,426 | 920,447 | 30,722 | 38.90 |
| 1952 | 1,736,388 | 339,763 | 37.55 | 911,863 | 887,471 | 1,116,583 | 35,471 | 37.41 |
| **Territorial Airlines** [1] | | | | | | | | |
| 1945 | 194,957 | 24,865 | 87.08 | 27,529 | 325,569 | 181,514 | 3,128 | n.a. |
| 1946 | 298,710 | 38,033 | 79.04 | 34,058 | 112,372 | 389,199 | 3,872 | 63.82 |
| 1947 | 375,607 | 46,833 | 71.10 | 43,307 | 115,774 | 635,925 | 4,702 | 58.58 |
| 1948 | 418,372 | 52,864 | 65.28 | 53,490 | 134,400 | 581,122 | 5,145 | 57.01 |
| 1949 | 421,151 | 52,897 | 55.65 | 70,219 | 124,370 | 617,948 | 5,181 | 50.41 |
| 1950 | 476,812 | 57,746 | 57.66 | 65,188 | 118,880 | 529,228 | 5,449 | 52.30 |
| 1951 | 550,387 | 65,799 | 55.27 | 58,504 | 100,283 | 855,195 | 6,298 | 47.92 |
| 1952 | 515,180 | 67,885 | 54.72 | 50,013 | 54,925 | 1,257,557 | 6,765 | 49.60 |
| **International Airlines** | | | | | | | | |
| 1941 | 228,524 | 162,824 | 65.56 | ..... | ..... | ..... | ..... | ..... |
| 1942 | 269,345 | 236,956 | 75.68 | ..... | ..... | ..... | ..... | ..... |
| 1943 | 279,402 | 244,229 | 79.42 | 1,990,715 [3] | 5,088,325 | ..... | 34,352 | ..... |
| 1944 | 341,496 | 310,574 | 79.37 | 2,048,150 | 6,207,137 | ..... | 39,705 | ..... |
| 1945 | 475,558 | 447,968 | 76.78 | 3,399,339 | 8,717,511 | ..... | 60,019 | ..... |
| 1946 | 1,041,283 | 1,100,741 | 70.85 | 6,141,461 | 15,090,468 | 60,037 | 136,771 | 64.61 |
| 1947 | 1,359,712 | 1,810,045 | 61.90 | 15,498,122 | 30,808,591 | 2,087,822 | 238,439 | 57.04 |
| 1948 | 1,372,856 | 1,888,947 | 57.38 | 20,657,018 | 41,581,133 | 4,011,668 | 265,429 | 56.61 |
| 1949 | 1,520,067 | 2,053,980 | 56.67 | 24,401,628 | 49,443,623 | 6,714,414 | 297,169 | 55.56 |
| 1950 | 1,675,477 | 2,206,396 | 59.71 | 26,218,016 | 44,512,759 | 16,049,809 | 319,674 | 57.61 |
| 1951 | 2,033,121 | 2,599,915 | 59.98 | 26,999,011 | ..... [4] | 71,260,378 | 371,414 | 61.97 |
| 1952 | 2,362,059 | 3,019,810 | 62.28 | 27,713,051 | ..... | 72,627,275 | 418,496 | 61.30 |

[1] Beginning with 1952, in accordance with CAB classification, Caribbean-Atlantic Airlines, is included with International rather than Territorial.

[2] These data were not reported to the CAB prior to 1946.

[3] International airmail includes 3 categories. An illustration of the proportions is:

| | U. S. Letters | U. S. Parcel Post | Foreign Airmail | Total |
|---|---|---|---|---|
| 1951 | 20,126,955 | 1,843,156 | 5,028,900 | 26,999,011 ton-miles |
| 1952 | 19,705,911 | 2,362,221 | 5,644,919 | 27,713,051 ton-miles |

[4] Express included with Freight after 1950.

## U. S. SCHEDULED AIRLINES OPERATING REVENUES 1941-1952

| Year | Passenger Revenues | % Of Total | U. S. Mail | % of Total | Express and Freight | % Of Total | Other Revenues [2] | % Of Total | Total Operating Revenues |
|---|---|---|---|---|---|---|---|---|---|
| **Domestic Trunk** | | | | | | | | | |
| 1941 ..... | $69,791,338 | 71.72 | $22,696,351 | 23.32 | $2,919,003 | 3.00 | $1,904,442 | 1.96 | $97,311,134 |
| 1942 ..... | 74,819,050 | 69.18 | 23,470,088 | 21.68 | 6,977,943 | 6.44 | 2,981,749 | 2.70 | 108,248,830 |
| 1943 ..... | 87,481,456 | 71.13 | 24,212,580 | 19.60 | 8,381,539 | 6.81 | 3,029,390 | 2.46 | 123,104,965 |
| 1944 ..... | 116,440,690 | 72.36 | 33,317,366 | 20.70 | 8,306,288 | 5.16 | 2,863,848 | 1.78 | 160,928,192 |
| 1945 ..... | 166,519,922 | 77.59 | 33,693,467 | 15.64 | 10,835,138 | 5.05 | 3,694,563 | 1.72 | 214,743,090 |
| 1946 ..... | 272,573,481 | 87.39 | 20,273,557 | 6.50 | 13,269,914 | 4.25 | 5,776,089 | 1.86 | 311,893,041 |
| 1947 ..... | 303,193,780 | 86.01 | 23,325,630 | 6.62 | 18,888,246 | 5 36 | 7,082,712 | 2.01 | 352,490,368 |
| 1948 ..... | 334,735,598 | 80.98 | 47,837,531 | 11.57 | 23,788,568 | 5.76 | 6,991,190 | 1.69 | 413,352,887 |
| 1949 ..... | 378,113,445 | 82.24 | 45,031,010 | 9.79 | 27,280,566 | 5.93 | 9,357,523 | 2.04 | 459,782,544 |
| 1950 ..... | 430,098,393 | 82.06 | 46,311,377 | 8.84 | 34,266,653 | 6.54 | 13,432,191 | 2.56 | 524,108,614 |
| 1951 ..... | 570,288,025 | 86.60 | 37,039,813 | 5.62 | 35,735,794 | 5.43 | 15,457,212 | 2.35 | 658,520,844 |
| 1952 [1] ..... | 669,769,257 | 87.55 | 36,282,686 | 4.74 | 41,309,483 | 5.40 | 17,670,000 | 2.31 | 765,031,426 |
| **Local Service** | | | | | | | | | |
| 1946 ..... | $ 314,638 | 16.30 | $ 1,558,614 | 80.71 | $ 13,008 | 0.67 | $ 44,797 | 2.32 | $1,931,057 |
| 1947 ..... | 2,280,124 | 26.99 | 5,957,097 | 70.51 | 60,179 | 0.71 | 150,931 | 1.79 | 8,448,331 |
| 1948 ..... | 4,666,549 | 28.64 | 11,282,490 | 69.25 | 147,958 | 0.91 | 195,512 | 1 20 | 16,292,509 |
| 1949 ..... | 7,362,007 | 33.55 | 14,054,998 | 64.06 | 252,159 | 1.15 | 271,465 | 1.24 | 21,940,629 |
| 1950 ..... | 10,302,859 | 36.17 | 17,191,453 | 60.36 | 442,046 | 1.55 | 544,543 | 1.92 | 28,480,901 |
| 1951 ..... | 16,259,176 | 43.21 | 19,739,169 | 52.45 | 666,230 | 1.77 | 967,572 | 2.57 | 37,632,147 |
| 1952 [1] ..... | 18,690,245 | 45.68 | 20,637,000 | 50.44 | 788,077 | 1.93 | 890,000 | 1.95 | 40,915,322 |
| **International** | | | | | | | | | |
| 1941 ..... | $14,020,811 | 36.91 | $15,472,179 | 40.73 | $1,475,207 | 3.88 | $7,021,770 | 18.48 | $37,989,967 |
| 1942 ..... | 20,970,792 | 51.31 | 9,038,810 | 22.12 | 4,318,924 | 10.57 | 6,541,299 | 16.00 | 40,869,825 |
| 1943 ..... | 19,333,389 | 58.87 | 3,624,223 | 11.04 | 4,401,466 | 13.40 | 5,480,095 | 16.69 | 32,839,173 |
| 1944 ..... | 24,287,050 | 62 47 | 2,889,093 | 7.43 | 5,405,470 | 13 90 | 6,300,788 | 16.20 | 38,882,401 |
| 1945 ..... | 38,858,800 | 56.23 | 12,246,219 | 17.75 | 7,314,743 | 10.58 | 10,691,311 | 15.44 | 69,111,073 |
| 1946 ..... | 91,416,767 | 62.29 | 25,060,600 | 17.08 | 11,413,268 | 7.78 | 18,863,467 | 12.85 | 146,754,102 |
| 1947 ..... | 140,652,113 | 67.29 | 32,299,890 | 15.45 | 17,526,276 | 8.39 | 18,531,252 | 8.87 | 209,009,531 |
| 1948 ..... | 151,337,705 | 60.72 | 57,331,556 | 23.00 | 20,808,679 | 8.35 | 19,756,259 | 7.93 | 249,234,199 |
| 1949 ..... | 158,479,705 | 57.81 | 75,197,073 | 27.43 | 22,126,830 | 8.07 | 18,350,930 | 6.69 | 274,154,538 |
| 1950 ..... | 160,672,885 | 61.77 | 55,689,069 | 21.41 | 21,663,922 | 8.33 | 22,105,532 | 8.49 | 260,131,408 |
| 1951 ..... | 184,691,825 | 64.14 | 53,213,231 | 18.48 | 25,244,764 | 8.77 | 24,785,841 | 8.61 | 287,935,661 |
| 1952 (Fiscal) (Year) | 160,432,025 | 69.14 | 36,380,720 | 15.68 | 19,366,289 | 8.35 | 15,850,415 | 6 83 | 232,029,449 |

[1] Estimated.

[2] Other Revenues—Excess baggage, nonscheduled transport service, other transportation and incidental revenues and foreign mail.

# U. S. SCHEDULED AIRLINES OPERATING EXPENSES 1941-1952

| Year | Flying Operations | % Of Total | Direct Maintenance Flying Equip. | % Of Total | Depreciation Flight Equipment | % Of Total |
|---|---|---|---|---|---|---|
| **Domestic** | | | | | | |
| 1941 | $27,391,837 | 30.5 | $9,789,797 | 10.9 | $7,750,571 | 8.6 |
| 1942 | 21,865,924 | 25.9 | 8,664,437 | 10.3 | 5,861,730 | 6.9 |
| 1943 | 20,739,121 | 21.7 | 9,132,260 | 9.5 | 4,742,030 | 5.0 |
| 1944 | 28,238,316 | 22.7 | 11,892,963 | 9.6 | 5,018,845 | 4.0 |
| 1945 | 43,421,033 | 24.0 | 16,392,654 | 9.1 | 9,408,938 | 5.2 |
| 1946 | 69,729,554 | 22.1 | 32,490,116 | 10.2 | 25,191,856 | 7.9 |
| 1947 | 85,932,761 | 23.0 | 41,029,360 | 11.0 | 36,240,510 | 9.7 |
| 1948 | 104,163,765 | 25.3 | 46,093,128 | 11.2 | 39,533,925 | 9.6 |
| 1949 | 119,961,143 | 27.6 | 50,270,468 | 11.6 | 39,447,911 | 9.0 |
| 1950 | 132,060,283 | 28.6 | 53,747,249 | 11.6 | 39,429,856 | 8.6 |
| 1951 | 160,469,094 | 29.1 | 66,571,477 | 12.0 | 41,272,647 | 7.5 |
| **Local Service** | | | | | | |
| 1946 | $ 497,438 | 24.1 | $ 347,727 | 16.9 | $ 151,010 | 7.3 |
| 1947 | 2,203,155 | 24.3 | 1,336,677 | 14.7 | 922,395 | 10.2 |
| 1948 | 4,526,827 | 28.4 | 2,338,788 | 14.8 | 1,455,756 | 9.1 |
| 1949 | 6,486,969 | 29.0 | 3,280,965 | 14.6 | 2,042,843 | 9.2 |
| 1950 | 8,687,483 | 31.0 | 3,594,219 | 12.8 | 1,617,079 | 5.8 |
| 1951 | 10,950,415 | 30.5 | 4,289,066 | 11 9 | 1,631,376 | 4.5 |
| **International** | | | | | | |
| 1941 | n.a. | | n.a. | | n.a. | |
| 1942 | n.a. | | n.a. | | n.a. | |
| 1943 | $ 8,074,416 | 25.2 | $2,172,952 | 6.8 | $1,744,326 | 5 4 |
| 1944 | 8,469,557 | 21.6 | 3,030,386 | 7.7 | 1,852,251 | 4.7 |
| 1945 | 15,297,599 | 24.8 | 5,198,602 | 8.4 | 2,421,832 | 3.9 |
| 1946 | 32,027,695 | 22.9 | 11,063,761 | 7.9 | 8,953,732 | 6.4 |
| 1947 | 53,188,662 | 25.4 | 21,997,077 | 10.5 | 18,579,977 | 8.9 |
| 1948 | 67,163,026 | 28.6 | 24,241,052 | 10 3 | 19,588,511 | 8.3 |
| 1949 | 72,346,828 | 28.6 | 26,310,942 | 10.4 | 23,675,868 | 9.4 |
| 1950 | 70,979,949 | 28.6 | 26,158,178 | 10.5 | 25,637,532 | 10.3 |
| 1951 | 75,031,034 | 27.8 | 29,855,966 | 11.1 | 24,263,357 | 9.0 |

| Year | Aircraft Operating Expenses | % Of Total | Ground And Indirect Expenses | % Of Total | Total Operating Expenses |
|---|---|---|---|---|---|
| **Domestic** | | | | | |
| 1941 | $44,932,205 | 50.0 | $44,986,928 | 50.0 | $89,919,133 |
| 1942 | 36,392,091 | 43.1 | 47,974,400 | 56.9 | 84,366,491 |
| 1943 | 34,613,411 | 36.2 | 60,949,609 | 63.8 | 95,563,020 |
| 1944 | 45,150,124 | 36.3 | 79,371,967 | 63.7 | 124,522,091 |
| 1945 | 69,222,625 | 38.3 | 111,403,704 | 61.7 | 180,626,329 |
| 1946 | 127,411,526 | 40.2 | 189,709,954 | 59.8 | 317,121,480 |
| 1947 | 163,202,631 | 43.7 | 210,187,837 | 56.3 | 373,390,468 |
| 1948 | 189,790,818 | 46.1 | 221,486,955 | 53.9 | 411,277,773 |
| 1949 | 209,679,522 | 48.2 | 225,477,685 | 51.8 | 435,157,207 |
| 1950 | 225,237,388 | 48.8 | 236,300,592 | 51.2 | 461,537,980 |
| 1951 | 268,313,218 | 48.6 | 284,268,070 | 51.4 | 552,581,288 |
| **Local Service** | | | | | |
| 1946 | $996,175 | 48.3 | $1,064,254 | 51.7 | $2,060,429 |
| 1947 | 4,462,227 | 49.2 | 4,607,078 | 50.8 | 9,069,305 |
| 1948 | 8,321,371 | 52.3 | 7,602,141 | 47.7 | 15,923,512 |
| 1949 | 11,810,777 | 52.8 | 10,570,938 | 47.2 | 22,381,715 |
| 1950 | 13,898,781 | 49.6 | 14,150,445 | 50.4 | 28,049,226 |
| 1951 | 16,870,857 | 46.9 | 19,124,227 | 53.1 | 35,995,084 |
| **International** | | | | | |
| 1941 | n. a. | | n. a. | | n. a. |
| 1942 | n. a. | | n. a. | | n. a. |
| 1943 | $11,991,694 | 37.4 | $20,087,295 | 62.6 | $32,078,989 |
| 1944 | 13,352,194 | 34.0 | 25,874,474 | 66.0 | 39,226,668 |
| 1945 | 22,918,033 | 37.1 | 38,846,750 | 62.9 | 61,764,783 |
| 1946 | 52,045,188 | 37.2 | 87,797,658 | 62.8 | 139,842,846 |
| 1947 | 93,765,716 | 44.8 | 115,527,816 | 55.2 | 209,293,532 |
| 1948 | 110,992,589 | 47.2 | 124,294,394 | 52.8 | 235,286,983 |
| 1949 | 122,333,638 | 48.4 | 130,529,491 | 51.6 | 252,863,129 |
| 1950 | 122,775,659 | 49.4 | 125,547,413 | 50.6 | 248,323,072 |
| 1951 | 129,150,357 | 47.9 | 140,580,121 | 52.1 | 269,730,478 |

Note: Insufficient data is available for estimating 1952 expenses due to changes in reporting requirements.

n.a.—not available.

## DISTRIBUTION OF 1951 GROUND AND INDIRECT EXPENSES FOR U. S. AIRLINES BY MAJOR ACCOUNTING CATEGORIES

| | Ground Operations | Ground & Indirect Maintenance | Passenger Service | Traffic And Sales | Advertising & Publicity | General and Administrative | Depreciation Ground Equip. |
|---|---|---|---|---|---|---|---|
| Domestic Trunk | 79,264,315 | 41,110,372 | 42,562,536 | 58,023,916 | 16,211,294 | 40,816,274 | 6,279,362 |
| Local Service | 6,362,680 | 2,584,178 | 1,671,151 | 3,942,731 | 1,073,348 | 3,366,714 | 451,273 |
| International | 34,961,666 | 20,014,276 | 17,513,918 | 29,832,382 | 11,374,406 | 23,905,202 | 3,042,057 |

TOTALS

| | Total Ground & Indirect Expense | Total Aircraft Operating Expense | Total Operating Expense |
|---|---|---|---|
| Domestic Trunk | 284,268,069 | 268,313,218 | 552,581,287 |
| Local Service | 19,452,075 | 17,263,521 | 36,715,596 |
| International | 140,643,907 | 129,221,191 | 269,865,098 |

AIRMAIL REVENUES AND SERVICE COSTS 1941-1952

| Fiscal Year | Airmail Revenues | All Allocated Post Office Costs Except Payments to Airlines | Payments to Airlines [2] | Net Post Office Balance |
|---|---|---|---|---|
| **Domestic, Local Service and Territorial** | | | | |
| 1941 | 23,920,465 | 10,184,619 | 20,697,220 | — 6,961,374 |
| 1942 | 33,417,367 | 13,035,417 | 23,473,170 | — 3,091,220 |
| 1943 [1] | 62,818,568 | 21,154,730 | 23,308,477 | +18,355,361 |
| 1944 | 79,412,510 | 21,480,220 | 28,401,373 | +29,530,917 |
| 1945 | 81,237,389 | 14,737,786 | 35,199,255 | +31,300,348 |
| 1946 | 68,427,924 | 20,278,453 | 28,733,479 | +19,415,992 |
| 1947 | 54,356,782 | 45,705,073 | 27,636,134 | —18,984,425 |
| 1948 | 53,586,950 | 30,438,635 | 50,223,746 | —27,075,431 |
| 1949 | 65,385,603 | 45,941,107 | 56,705,560 | —37,261,064 |
| 1950 | 74,120,038 | 47,235,853 | 62,386,052 | —35,501,867 |
| 1951 | 95,425,704 | 60,274,073 | 61,141,000 | —25,989,369 |
| 1952 [4] | 119,924,293 | 84,134,000 | 58,895,000 | —23,104,707 |
| **International** | | | | |
| 1941 | 9,309,793 | 3,786,266 | 13,628,695 | — 8,024,168 |
| 1942 | 12,015,864 | 1,438,513 | 14,298,159 | — 3,720,808 |
| 1943 [1] | 28,500,000 | 1,505,742 | 5,563,283 | + 4,442,459 |
| 1944 [2] | 51,276,499 | 27,169,035 | 3,231,371 | +20,876,093 |
| 1945 | 110,675,066 | 51,630,408 | 6,021,671 | +53,022,987 |
| 1946 | 58,081,237 | 31,794,545 | 14,612,000 | +11,674,692 |
| 1947 | 21,772,578 | 4,602,428 | 28,528,000 | —11,357,850 |
| 1948 | 23,815,519 | 7,855,220 | 43,716,000 | —27,755,701 |
| 1949 | 25,695,375 | 21,921,670 | 51,497,000 | —47,723,295 |
| 1950 | 27,334,124 | 23,272,463 | 55,014,000 | —50,952,339 |
| 1951 | 31,306,067 | 20,876,677 | 57,116,000 | —46,686,610 |
| 1952 [4] | 33,673,988 | 25,862,396 | 56,320,000 | —48,508,408 |

**1** No cost ascertainment report for 1943. Expenses are estimated.

**2** During war years overseas mail, except for Latin America, was carried by Air Transport Command with consequent reductions in sums paid to airlines.

**3** Payments to airlines may be subject to retroactive adjustment by the Civil Aeronautics Board back to 1948 for domestic and 1946 for international.

**4** 1952 figures are either preliminaries or estimates.

## U. S. SCHEDULED AIRLINES ASSETS AND LIABILITIES for selected years

| | 1941 (12/31) | 1946 (12/31) | 1951 (12/31) | 1952 (9/30) |
|---|---|---|---|---|
| **Domestic Trunk Lines** | | | | |
| (Including international operations of these carriers) | | | | |
| *Assets* | | | | |
| Current Assets | $48,766,772 | $152,381,835 | $286,240,000 | $337,418,000 |
| Investments & Special Funds | 2,863,981 | 51,140,907 | 62,194,000 | 47,635,000 |
| Flight Equipment | 61,776,693 | 242,877,281 | 436,153,000 | 536,215,000 |
| —Depreciation | 29,364,884 | 74,751,529 | 209,929,000 | 251,324,000 |
| Flight Equipment—Net | 32,411,809 | 168,125,752 | 226,224,000 | 284,891,000 |
| Other Operating Property—Net | ..... | ..... | 61,153,000 | 71,499,000 |
| Non-Operating Property—Net | 903,194 | ..... | 759,000 | 311,000 |
| Deferred Charges | 3,031,349 | 15,322,859 | 11,186,000 | 9,532,000 |
| Other Assets | 301,729 | 129,134 | 794,000 | 433,000 |
| Total Assets | $88,278,774 | $387,100,487 | $648,550,000 | $751,719,000 |
| *Liabilities* | | | | |
| Current Liabilities | $22,195,524 | $105,659,559 | $218,363,000 | $229,699,000 |
| Long Term Debt | 1,769,771 | 90,097,739 | 134,006,000 | 157,681,000 |
| Capital Stock | 33,095,620 | 92,896,915 | 127,431,000 | 142,170,000 |
| Capital Surplus | 22,402,837 | 46,989,967 | 63,698,000 | 81,632,000 |
| Earned Surplus | 5,949,126 | 41,018,688 | 97,141,000 | 88,148,000 |
| Operating Reserves | 1,015,725 | 1,139,235 | 3,682,000 | 6,620,000 |
| Other Liabilities | 1,850,171 | 9,298,384 | 4,228,000 | 45,769,000 |
| Total Liabilities | $88,278,774 | $387,100,487 | $648,549,000 | $751,719,000 |
| **Local Service** | | | | |
| *Assets* | | | | |
| Current Assets | ..... | $1,926,386 | $10,694,189 | $ 9,839,176 |
| Investments & Special Funds | ..... | 916,592 | 776,091 | 1,098,096 |
| Flight Equipment | ..... | 3,330,764 | ..... | ..... |
| —Depreciation | ..... | 499,364 | ..... | ..... |
| Flight Equipment—Net | ..... | 2,831,400 | 5,492,710 | 9,453,841 |
| Other Operating Property—Net | ..... | ..... | 2,104,000 | 2,556,000 |
| Non-Operating Property—Net | ..... | ..... | 22,000 | 247,000 |
| Deferred Charges | ..... | 573,637 | 1,022,563 | 1,233,067 |
| Other Assets | ..... | 190,048 | 51,566 | 35,941 |
| Total Assets | ..... | $6,438,263 | $20,163,119 | $24,463,121 |
| *Liabilities* | | | | |
| Current Liabilities | ..... | $1,984,949 | $ 8,025,592 | $ 9,847,972 |
| Long Term Debt | ..... | 500,000 | 1,943,305 | 3,406,977 |
| Capital Stock | ..... | 1,407,987 | 7,160,802 | 7,215,158 |
| Capital Surplus | ..... | 2,790,985 | 4,487,884 | 5,641,158 |
| Earned Surplus | ..... | (532,303) | (1,821,466) | (2,081,656) |
| Operating Reserves | ..... | 50,331 | 33,130 | 393,026 |
| Other Liabilities | ..... | 236,315 | 333,872 | 40,486 |
| Total Liabilities | ..... | $6,438,264 | $20,163,119 | $24,463,121 |
| **International** | | | | |
| *(Pan American and Panagra Only)* | | | | |
| *Assets* | | | | |
| Current Assets | $13,915,046 | $ 98,282,686 | $ 92,210,000 | $ 83,412,000 |
| Investments & Special Funds | 8,480,673 | 19,576,414 | 15,802,000 | 12,827,000 |
| Flight Equipment | ..... | 83,083,114 | 133,167,000 | 158,342,000 |
| —Depreciation | ..... | 22,339,084 | 65,860,000 | 75,200,000 |
| Flight Equipment—Net | 19,260,215 | 60,744,030 | 67,307,000 | 83,142,000 |
| Other Operating Property—Net | 7,663,116 | ..... | 12,649,000 | 13,233,000 |
| Deferred Charges | 2,668,398 | 8,753,037 | 25,034,000 | 26,857,000 |
| Other Assets | 7,227,988 | ..... | 721,000 | 734,000 |
| Total Assets | $59,215,436 | $187,356,167 | $213,723,000 | $220,205,000 |
| *Liabilities* | | | | |
| Current Liabilities | $10,017,675 | $ 39,401,012 | $ 66,114,000 | $ 64,700,000 |
| Long Term Debt | 489,428 | 69,308,397 | 27,950,000 | 27,750,000 |
| Capital Stock | 9,686,975 | 16,664,825 | 10,892,000 | 10,867,000 |
| Capital Surplus | 14,707,605 | 21,517,529 | 62,803,000 | 62,828,000 |
| Earned Surplus | 4,895,733 | 12,804,477 | 23,149,000 | 28,290,000 |
| Operating Reserves | 17,345,045 | 17,000,062 | 6,821,000 | 8,581,000 |
| Other Liabilities | 2,072,975 | 10,659,865 | 15,994,000 | 17,189,000 |
| Total Liabilities | $59,215,436 | $187,356,167 | $213,723,000 | $220,205,000 |

Section 4

## UNITED STATES INTERCITY PASSENGER MILES BY COMMON CARRIERS AND PRIVATE AUTOMOBILES 1945-1952

*Does not include rail commutation, electric railway and waterborne passenger traffic*

(Millions of Passenger Miles)

| | 1945 | 1946 | 1947 | 1948 | 1949 | 1950 | 1951 | 1952 |
|---|---|---|---|---|---|---|---|---|
| ***Pullman and Air Travel*** | | | | | | | | |
| Rail Pullman ..... | 26,912 | 19,801 | 12,261 | 11,015 | 9,349 | 9,340 | 10,226 | 9,504 |
| Domestic trunk lines | 3,336 | 5,903 | 6,011 | 5,823 | 6,563 | 7,766 | 10,211 | 12,121 |
| Domestic local service lines ..... | 1 | 7 | 47 | 88 | 135 | 189 | 290 | 346 |
| Pullman and Air combined ... | 30,249 | 25,711 | 18,319 | 16,926 | 16,047 | 17,295 | 20,727 | 21,871 |
| Airline % of this total ..... | 11 03 | 22.99 | 33.07 | 34.92 | 41.74 | 46.00 | 50.66 | 55.42 |
| ***Other Common Carriers*** | | | | | | | | |
| Rail coach ..... | 59,415 | 39,039 | 27,665 | 24,315 | 20,273 | 17,441 | 19,524 | 19,758 |
| Intercity Motor Bus lines ..... | 26,927 | 25,576 | 23,948 | 23,529 | 22,411 | 21,254 | 21,499 | 20,732 |
| Total ..... | 86,342 | 64,615 | 51,613 | 47,844 | 42,684 | 38,695 | 41,023 | 40,490 |
| ***Total All Common Carriers*** | 116,591 | 90,326 | 69,932 | 64,770 | 58,731 | 55,990 | 61,750 | 62,361 |
| ***Private Automobile Intercity*** | 179,837 | 253,570 | 272,958 | 287,423 | 316,774 | 337,339 | 379,324 | 390,704 |
| ***Total Common and Private Carriers*** | 296,428 | 343,896 | 342,890 | 352,193 | 375,505 | 393,329 | 441,074 | 453,065 |
| Common Carrier % of Total ..... | 39.33 | 26.27 | 20.39 | 18.39 | 15.64 | 14.23 | 14.00 | 13.76 |
| ***Passenger Miles Per Capita*** | 2,118 | 2,432 | 2,392 | 2,412 | 2,528 | 2,619 | 2,919 | 2,959 |

## COMPARATIVE TRANSPORTATION SAFETY RECORD 1941-1952

Rate per 100,000,000 Passenger Miles

| | 1941 | 1942 | 1943 | 1944 | 1945 | 1946 | 1947 | 1948 | 1949 | 1950 | 1951 | 1952 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Domestic scheduled air transportation*** | | | | | | | | | | | | |
| Fatalities .... | 35 | 55 | 22 | 48 | 76 | 75 | 199 | 83 | 93 | 96 | 142 | 46 |
| Rate ..... | 2.3 | 3.7 | 1.2 | 2.2 | 2.2 | 1.2 | 3.2 | 1.3 | 1.3 | 1.1 | 1.3 | .4 |
| ***International scheduled air transportation*** | | | | | | | | | | | | |
| Fatalities .... | 2 | 0 | 10 | 17 | 17 | 40 | 20 | 44 | 0 | 48 | 31 | 94 |
| Rate ..... | 1 2 | .. | 3.9 | 5.3 | 3.7 | 3.5 | 1.1 | 1 0 | .. | 2.1 | 1.2 | 3.1 |
| ***Intercity motor buses*** | | | | | | | | | | | | |
| Fatalities .... | x | x | x | x | 120 | 140 | 140 | 120 | 120 | 100 | 130 | x |
| Rate ..... | .24 | .23 | .22 | .22 | .17 | .19 | .21 | .18 | .20 | .17 | .22 | x |
| ***Railroad passenger trains*** | | | | | | | | | | | | |
| Fatalities .... | 39 | 110 | 262 | 249 | 142 | 116 | 74 | 52 | 32 | 184 | 126 | 0 |
| Rate ..... | .14 | .20 | .30 | .26 | .16 | .18 | .16 | .13 | .09 | .58 | .41 | .. |
| ***Passenger automobiles and taxicabs*** | | | | | | | | | | | | |
| Fatalities .... | x | x | x | x | 12,900 | 15,400 | 15,300 | 15,200 | 15,300 | 17,600 | 21,000 | x |
| Rate ..... | 4.0 | 2.7 | 2.7 | 2.9 | 2.9 | 2.5 | 2.3 | 2.1 | 2.0 | 2.2 | 2.4 | x |

x Not available

# The Air Transport Association of America

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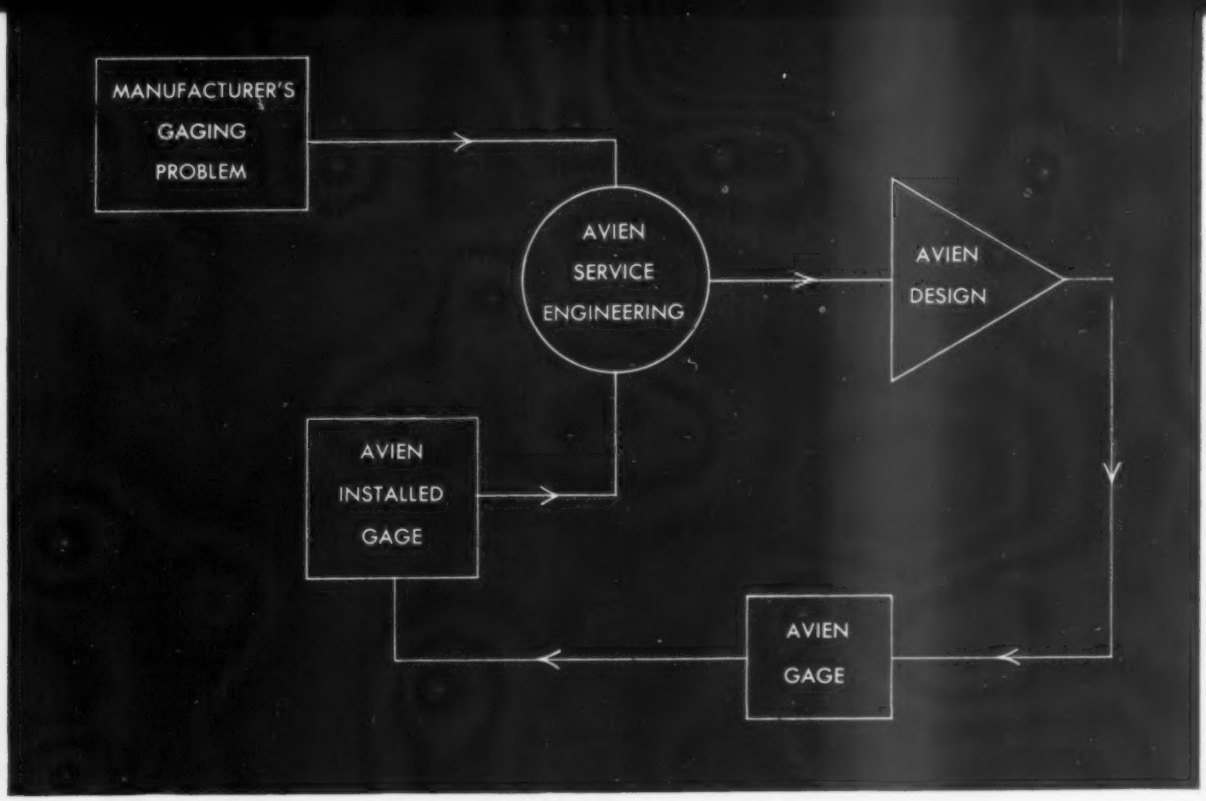


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## Mass CAA Lay-offs Seen Unlikely

The CAA's revised fiscal 1954 budget of $140,947,000 represents a reduction of 800 positions from the so-called "Truman budget," but this does not mean that 800 people will be laid off.

CAA officials are as yet unable to tell what the net reduction will be. It is possible that it will be very small, if the budget passes Congress as proposed. The Truman budget added several hundred persons to the CAA payroll, and these positions, of course, will not be filled. In addition, since last December there has been a "freeze" on new CAA personnel, resulting in unfilled positions. Officials emphasize, therefore, that the reduction of 800 positions is very misleading.

### Airways

CAA plans for fiscal 1954 include:

• **A 5% cut under fiscal 1953** in preventive maintenance of airways and communications equipment. This will amount to about $1 million and 200 positions.

• **Plans to order eight surveillance radar units have been canceled,** which will save some $2 million. Original plans were to buy 12, but only four will be ordered. These four were justified on the basis of the traffic density at the fields where they will be installed. The difference in density between the first four fields and the remainder was very sharp, and represented a logical break-point to curtail the program.

• **A number of control towers will be eliminated** because present traffic is not up to the minimum required for a CAA facility.

• **Some control towers and communications centers** will be consolidated, with resultant savings in personnel.

• **Personnel will be added** in airways traffic control to handle the increased traffic.

### Aviation Safety

• **Thirty-four operations, maintenance, and engineering agents** will be added for air carrier activities. However, agents in this category will also collect airport data, a function now handled by airport division personnel.

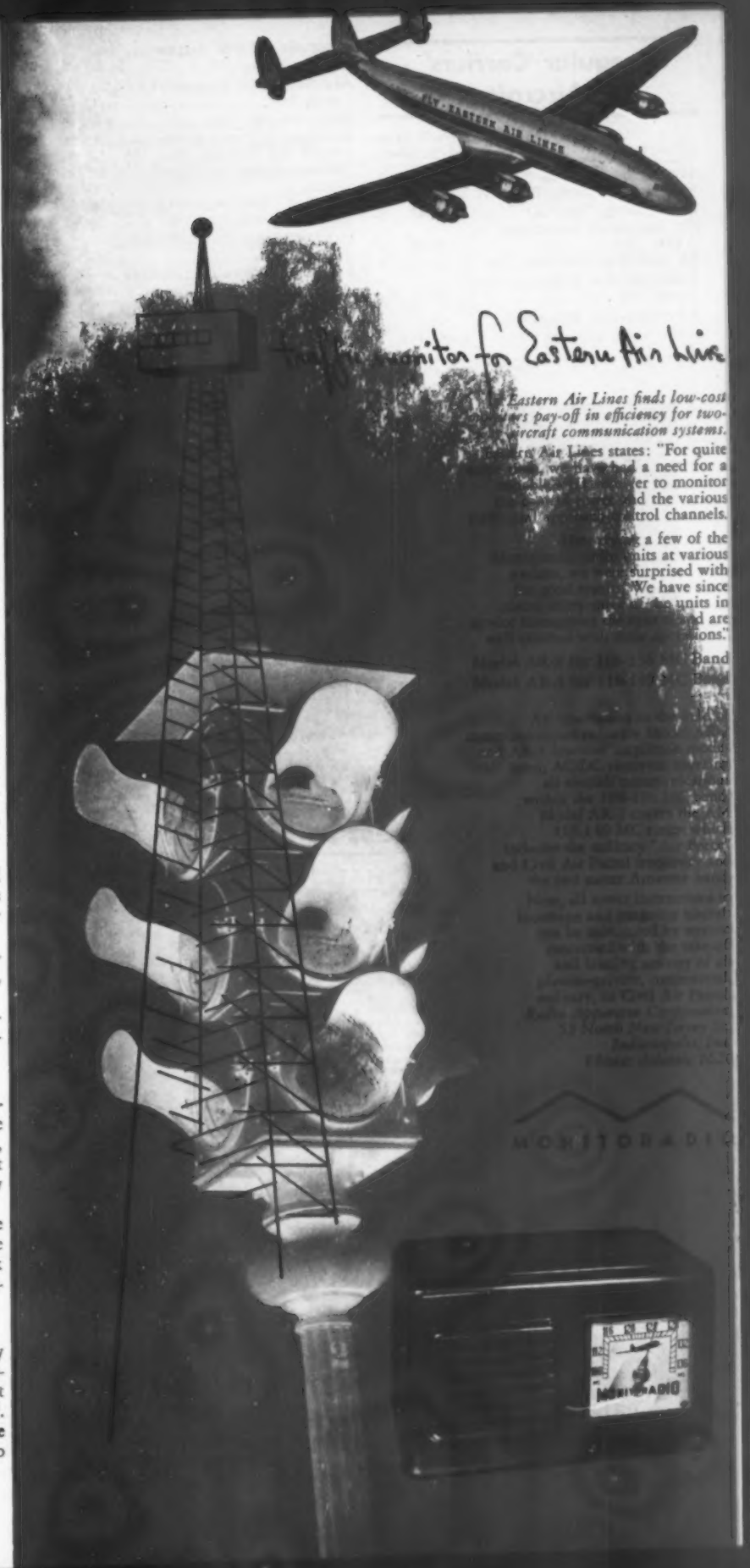
• **Regional medical divisions are eliminated.** A headquarters staff will be maintained in Washington. Most work in the regions is done by doctors designated by CAA.

### Airports

• **The airport management advisory service is eliminated,** both in Washington and in the regions. This was almost worked out a year ago, but was reinstated.

• **There are no plans to eliminate the Office of Airports,** contrary to rumors.





## Irregular Carriers' Aircraft

| Carrier | Aircraft type and number | |
|---|---|---|
| Aero Finance Corp. (A) | C-46 | 2 |
| Air Cargo Express, Inc. (A) | C-46 | 1 |
| Air America, Inc. (A) | C-46 | 5 |
| Air Transport Associates, Inc. (A) | C-46 | 4 |
| All American Airways, Inc. (I) | C-46 | 2 |
| American Air Export & Import Co. (I) | C-46 | 4 |
| American Air Transport, Inc. (A) | C-46 | 1 |
| American Flyers Airline Corp. (I) | DC-3 | 2 |
| Associated Air Transport, Inc. (I) | C-46 | 2 |
| Arctic-Pacific, Inc. (I) | PBY-5 | 1 |
| Argonaut Airways Corp. (A) | C-46 | 1 |
| Arnold Air Service, Inc. (A) | C-46 | 1 |
| Associated Air Transport, Inc. (I) | C-46 | 2 |
| Aviation Corp. of Seattle (I) | C-46 | 2 |
| Blatz Airlines, Inc. (A) | DC-3 | 1 |
| California Air Charter, Inc. (A) | DC-3 | 2 |
| California Hawaiian Airlines (A) | LO49 | 1 |
| | 2-0-2 | 5 |
| Capitol Airways, Inc. (I) | DC-3 | 3 |
| | C-46 | 1 |
| Caribbean American Lines, Inc. (A) | C-46 | 1 |
| Central Air Transport, Inc. (A) | C-46 | 1 |
| Coastal Cargo Co., Inc. (I) | C-46 | 2 |
| Conner Air Lines, Inc. (A) | C-46 | 1 |
| Continental Charters, Inc. (I) | C-46 | 3 |
| Currey Air Transport, Ltd. (A) | C-46 | 1 |
| Economy Airways, Inc. (I) | C-46 | 1 |
| Federated Airlines, Inc. (A) | C-46 | 1 |
| Flying Tiger Lines, Inc. (I)* | DC-4 | 12 |
| | C-46 | 26 |
| General Airways, Inc. (A) | DC-4 | 3 |
| Great Lakes Airlines, Inc. (A) | DC-4 | 1 |
| Hemisphere Air Transport (A) | DC-3 | 1 |
| | DC-4 | 2 |
| Johnson Flying Service, Inc. (A) | DC-3 | 2 |
| Los Angeles Air Service, Inc. (A) | NA | |
| Meteor Air Transport, Inc. (A) | C-46 | 2 |
| Miami Airlines, Inc. (A) | DC-3 | 2 |
| | C-46 | 1 |
| Modern Air Transport, Inc. (A) | C-46 | 2 |
| Monarch Air Service (A) | C-46 | 1 |
| North American Airlines, Inc. (A) | DC-3 | 2 |
| | DC-4 | 5 |
| Overseas National Airways (I) | DC-4 | 5 |
| Peninsula Air Transport (A) | DC-3 | 1 |
| | C-46 | 2 |
| Regina Cargo Airlines, Inc. (A) | DC-3 | 1 |
| Sourdough Air Transport, Inc. (A) | C-46 | 1 |
| Southern Air Transport, Inc. (A) | C-46 | 3 |
| S.S.W. Inc. (A) | C-46 | 1 |
| Standard Air Cargo (A) | DC-3 | 2 |
| Trans-Alaskan Airlines, Inc. (A) | DC-3 | 1 |
| Trans American Airways, Inc. (A) | DC-4 | 1 |
| Trans-Caribbean Airways, Inc. (I) | DC-4 | 5 |
| | C-46 | 2 |
| Trans-National Airlines, Inc. (A) | DC-3 | 1 |
| | DC-4 | 1 |
| Transocean Air Lines (I) | DC-3 | 5 |
| | DC-4 | 5 |
| | DC-6 | 1 |
| | C-46 | 5 |
| U. S. Aircoach (A) | DC-3 | 2 |
| | DC-4 | 1 |
| | C-46 | 1 |
| Unit Export Co., Inc. (A) | C-46 | 1 |
| U. S. Overseas Airlines, Inc. (A) | DC-4 | 5 |
| Viking Airlines, Inc. (A) | NA | |
| World Airways, Inc. (A) | C-46 | 2 |

**GRAND TOTALS**

| | | |
|---|---|---|
| Douglas | DC-3 | 28 |
| Douglas | DC-4 | 46 |
| Douglas | DC-6 | 1 |
| Convair | PBY-5 | 1 |
| Lockheed | L-049 | 1 |
| Martin | 2-0-2 | 5 |
| Curtiss | C-46 | 94 |
| **TOTAL ALL TYPES** | | 176 |

*(A)—Members of Aircoach Transport Association, Inc.—ACTA.*
*(I)—Members of Independent Military Air Transport Association—IMATA.*
*(*)—Flying Tiger Line also scheduled cargo air carrier.*
*NA—Not Available.*

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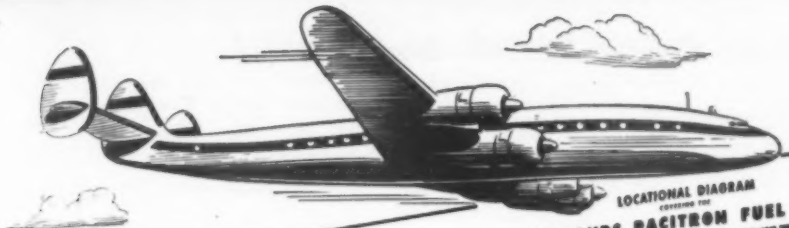
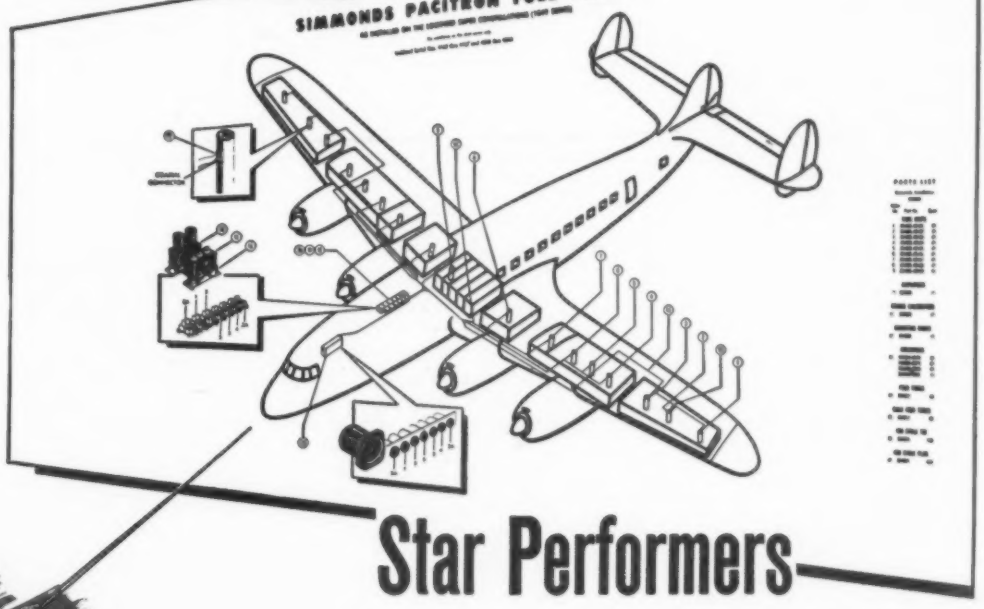
## Milestone

First Government appropriation for air operations. $125,000 authorized for Army fiscal year 1915.

March 3, 1911






# Star Performers— in the New Super Constellation

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Certain to set new records in speed, economy and range are Lockheed's new Super Constellations with Wright Turbo Compound engines. Like their distinguished predecessors, these luxury liners are equipped with Simmonds capacitance fuel gages.

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**Manufacturing Divisions:** Vergennes, Vermont • Danbury, Conn.

Sole Canadian Licensee: Simmonds Aerocessories of Canada, Ltd.

## Scheduled Air Carrier Aircraft—Domestic

| Operator | Douglas | | | Lockheed | | | | | Martin | | Boeing | Convair | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | DC6 | DC4 | DC3 | 1049 | 749 | 649 | 049 | 18 | 404 | 202 | 377 | 340 | 240 | |
| Allegheny Airlines | ... | ... | 12 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 12 |
| American Airlines | 66 | 8 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 77 | 151 |
| Bonanza Air Lines | ... | ... | 4 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 4 |
| Braniff Airways | 9 | 8 | 33 | ... | ... | ... | ... | ... | ... | ... | ... | 7 | 3 | 60 |
| Capital Airlines | ... | 24 | 25 | ... | 2 | ... | 5 | ... | ... | ... | ... | ... | ... | 56 |
| Central Airlines | ... | ... | 6 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 6 |
| Chicago & Southern Airl. | ... | ... | 12 | ... | 1 | 5 | ... | ... | ... | ... | ... | ... | ... | 18 |
| Colonial Airlines | ... | 4 | 8 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 12 |
| Continental Airlines | ... | ... | 10 | ... | .. | ... | ... | ... | ... | ... | ... | ... | 5 | 15 |
| Delta Air Lines | 7 | 5 | 20 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 32 |
| Eastern Air Lines | ... | 11 | 16 | 14 | 20 | ... | ... | ... | 56 | ... | ... | ... | .. | 117 |
| Frontier Airlines | ... | ... | 12 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 12 |
| Lake Central Airlines | ... | ... | 4 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 4 |
| Mohawk Airlines | ... | ... | 9 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 9 |
| National Airlines | 14 | 3 | ... | ... | ... | ... | ... | 11 | ... | ... | ... | ... | ... | 28 |
| North Central Airlines | ... | ... | 10 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 10 |
| Northeast Airlines | ... | ... | 9 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 4 | 13 |
| Northwest Airlines | ... | 24 | 8 | ... | ... | ... | ... | ... | ... | ... | 10 | ... | ... | 42 |
| Ozark Airlines | ... | ... | 9 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 9 |
| Piedmont Airlines | ... | ... | 11 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 11 |
| Pioneer Air Lines | ... | ... | ... | ... | ... | ... | ... | ... | ... | 9 | ... | ... | ... | 9 |
| Southern Airways | ... | ... | 9 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 9 |
| Southwest Airways | ... | ... | 10 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 10 |
| Trans-Texas Airways | ... | ... | 9 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 9 |
| TWA (Domestic) | ... | 13 | 42 | 10 | 36 | ... | 32 | ... | 40 | 12 | ... | ... | ... | 185 |
| United Air Lines | 62 | 19 | 53 | ... | ... | ... | ... | ... | ... | ... | 6 | 17 | ... | 157 |
| West Coast Airlines | ... | ... | 12 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 12 |
| Western Airlines | 3 | 5 | 10 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 10 | 28 |
| TOTAL | *161 | 124 | 363 | 24 | 59 | 5 | 37 | 11 | 96 | 21 | 16 | 24 | 99 | 1040 |

*Notes: National Airlines DC-6 fleet reduced to 13 DC-6 by aircraft loss. Mohawk Airlines DC-3 increased to 10 by aircraft purchase. Eastern Air Lines DC-3 fleet reduced to zero by sale. Continental Air Lines five CV-240 replaced by CV-340.*
** Includes 43 DC-6B (AA 17, NAL 7, & UAL 19)*

## Scheduled Air Carrier—International

| Operator | Douglas | | | Lockheed | | | | Boeing | | Convair | | Miscellaneous | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | DC6 | DC4 | DC3 | 1049 | 749 | 649 | 049 | 5C | 377 | 340 | 240 | Curtiss C46 | D2 | CH300 | RC3 | G44 | G21A | PBY | |
| Alaska Airlines | .... | 2 | 4 | .. | ..... | .. | ..... | .. | ..... | .. | .. | ‡3 | .. | .. | .. | .. | .. | .. | 9 |
| Alaska Coastal Airl. | .... | ..... | ... | .. | ..... | .. | ..... | 2 | ..... | .. | .. | .. | 1 | 1 | 1 | 2 | 5 | 1 | 13 |
| American Airlines | *66 | *8 | ... | .. | ..... | .. | ..... | .. | ..... | .. | 77 | .. | .. | .. | .. | .. | .. | .. | 151 |
| Braniff Airways | *9 | *3 | ... | .. | ..... | .. | ..... | .. | ..... | .. | .. | .. | .. | .. | .. | .. | .. | .. | 12 |
| Caribbean Atl. Airl. | .... | ..... | 3 | .. | ..... | .. | ..... | .. | ..... | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 |
| Chicago & Southern Airl. | .... | ..... | *12 | .. | *1 | *5 | ..... | .. | ..... | .. | .. | .. | .. | .. | .. | .. | .. | .. | 18 |
| Colonial Airlines | .... | *4 | *8 | .. | ..... | .. | ..... | .. | ..... | .. | .. | .. | .. | .. | .. | .. | .. | .. | 12 |
| Eastern Airlines | .... | *11 | ... | *14 | *20 | .. | ..... | .. | ..... | .. | .. | .. | .. | .. | .. | .. | .. | .. | 45 |
| Ellis Air Lines | .... | ..... | ... | .. | ..... | .. | ..... | .. | ..... | .. | .. | .. | .. | .. | .. | .. | 6 | .. | 6 |
| Hawaiian Airlines | .... | ..... | 13 | .. | ..... | .. | ..... | .. | ..... | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 14 |
| National Airlines | *14 | *3 | ... | .. | ..... | .. | ..... | .. | ..... | .. | .. | .. | .. | .. | .. | .. | .. | .. | 17 |
| Northern Cons. Airl. | .... | ..... | 3 | .. | ..... | .. | ..... | .. | ..... | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 |
| Northwest Airlines | .... | *24 | ... | .. | ..... | .. | ..... | .. | *10 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 24 |
| Pacific Northern Airl. | .... | 2 | 4 | .. | ..... | .. | ..... | .. | ..... | .. | .. | .. | .. | .. | .. | .. | .. | .. | 6 |
| Panagra | 8(f) | 2 | 9 | .. | ..... | .. | ..... | .. | ..... | .. | .. | .. | .. | .. | .. | .. | .. | .. | 19 |
| PAWA-AD | 17(e) | 29(b) | 2 | .. | ..... | .. | 14(a) | .. | (c) | .. | .. | .. | .. | .. | .. | .. | .. | .. | 63 |
| PAWA-LAD | (e) | (b) | 7 | .. | ..... | .. | (a) | .. | 14(c) | .. | 14 | .. | .. | .. | .. | .. | .. | .. | 35 |
| PAWA-PAD | .... | 15 | ... | .. | ..... | .. | (a) | .. | 14(Cert.3) | .. | .. | .. | .. | .. | .. | .. | .. | .. | 29 |
| Reeve Aleutian Airw. | .... | ..... | 3 | .. | ..... | .. | ..... | .. | ..... | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 |
| Resort Air Lines | .... | ..... | ... | .. | ..... | .. | ..... | .. | ..... | .. | .. | †13 | .. | .. | .. | .. | .. | .. | 13 |
| Trans Pacific Airl. | .... | ..... | 5 | .. | ..... | .. | ..... | .. | ..... | .. | .. | .. | .. | .. | .. | .. | .. | .. | 5 |
| TWA (International) | .... | *2 | ... | .. | *24(d) | .. | ..... | .. | ..... | .. | .. | .. | .. | .. | .. | .. | .. | .. | 26 |
| United Air Lines | *9 | ..... | ... | .. | ..... | .. | ..... | .. | *6 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 15 |
| Wien Alaska Airlines | .... | ..... | 3 | .. | ..... | .. | ..... | .. | ..... | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 4 |
| TOTAL | 124 | 105 | 76 | 14 | 45 | 5 | 14 | 2 | 44 | 1 | 91 | 17 | 1 | 1 | 1 | 2 | 11 | 1 | 535 |

** Also listed on domestic certificate.*
*† Operated in accordance with Provision Special CAR No. SR-338.*
*‡ Operated in accordance with CAR No. SR-368.*

*(a) Listed on Certificates 1, 3 and 6.*
*(b) DC4's shown on Certificate 1 are also operated on Cert. 6.*
*(c) B-377's shown on Certificate 6 are listed on 1.*
*(d) 12—additional L-749's shown on domestic Cert. No. 17.*
*(e) (DC-6B) Same aircraft listed on Certificates 1 and 6.*
*(f) Includes two DC-6B aircraft.*

# Scheduled Air Carrier, Special Service—Domestic

| Operator | Douglas | | | Lockheed | | | | | Martin | | Boeing | Convair | | | Curtiss | Helicopter | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | DC6 | DC4 | DC3 | 1049 | 749 | 649 | 049 | 18 | 404 | 202 | 377 | 340 | 240 | C46 | S51 | S55 | B47D | Misc. T50 | Total |
| HELICOPTERS | | | | | | | | | | | | | | | | | | | |
| Helicopter Air Service | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 6 | .. | 6 |
| Los Angeles Airways | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | 2 | .. | .. | 5 |
| New York Airways | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | .. | .. | 3 |
| "CARGO ONLY" | | | | | | | | | | | | | | | | | | | |
| Flying Tiger Line | .. | 11 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 25 | .. | .. | .. | .. | 36 |
| Riddle Aviation Co. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 7 | .. | .. | .. | .. | 7 |
| Slick Airways, Inc. | 2‡ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 21 | .. | .. | .. | .. | 23 |
| U. S. Airlines | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 5 | .. | .. | .. | .. | 5 |
| LOCAL AREAS | | | | | | | | | | | | | | | | | | | |
| E. W. Wiggins Airways | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 5 | 5 |
| INTRASTATE* | | | | | | | | | | | | | | | | | | | |
| California Cent. Airl. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 5 | .. | .. | .. | .. | .. | .. | .. | .. | 6 |
| Friedkin Aeronautics, Inc. | .. | .. | 4 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 |
| Stewart Air Service† | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 |
| TOTAL | 2 | 11 | 6 | 0 | 0 | 0 | 1 | 0 | 0 | 5 | 0 | 0 | 0 | 58 | 3 | 5 | 6 | 5 | 102 |
| Acft. listed on trunk & feeder certs. | 161 | 124 | 363 | 24 | 59 | 5 | 37 | 11 | 96 | 21 | 16 | 24 | 99 | 0 | 0 | 0 | 0 | 0 | 1040 |
| Acft. listed on helicopters, "cargo only," local area, & intrastate certs. | 2 | 11 | 6 | 0 | 0 | 0 | 1 | 0 | 0 | 5 | 0 | 0 | 0 | 58 | 3 | 5 | 6 | 5 | 102 |
| Acft. listed on all domestic certificates | 163 | 135 | 369 | 24 | 59 | 5 | 38 | 11 | 96 | 26 | 16 | 24 | 99 | 58 | 3 | 5 | 6 | 5 | 1042 |

* *Operators certificated under CAR—Part 45, engaged in scheduled intrastate passenger service utilizing large aircraft.*

† *Seasonal operation only.*

‡ *(DC-6A)*

# Recapitulation

| Type of Operation | Service | DC6 | DC4 | DC3 | 1049 | 749 | 649 | 049 | 18 | 5C | 404 | 202 | 377 | 340 | 240 | C46 | D2 | S51 | S55 | B47D | CH300 | RB1 | T50 | G44 | G21A | PBY | RC3 | 247 | S43 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) Sched. Dom. | Aircraft Utilized for Trunk and Feeder Serv. Only | 63 | 69 | 343 | 10 | 14 | 0 | 37 | 11 | 0 | 96 | 21 | 0 | 7 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 693 |
| (2) Sched. Dom. | Aircraft Utilized for Helicopter Service Only | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 5 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 |
| (3) Sched. Dom. | Aircraft Utilized for "Cargo Only" Service | 2 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 58 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 71 |
| (4) Sched. Dom. | Aircraft Utilized for Local Area Service Only | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| (5) Sched. Dom. | Aircraft Utilized for Intrastate Service (lg.Acft.) | 0 | 0 | 6 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 |
| (6) Sched. Int. | Aircraft Utilized for International Service Only | 32 | 50 | 56 | 0 | 0 | 0 | 14 | 0 | 2 | 0 | 0 | 28 | 1 | 14 | 17 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 11 | 1 | 1 | 0 | 0 | 231 |
| (7) Sched. Dom. Int. | Aircraft Utilized for either Domestic or International Service | 98 | 55 | 20 | 14 | 45 | 5 | 0 | 0 | 0 | 0 | 0 | 16 | 0 | 77 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 330 |
| (8) Irreg. Dom. Int. | Aircraft Utilized in Irregular Air Carrier Service | 1 | 52 | 35 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 74 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 166 |
| (9) GRA... TOTA... | Domestic and Int. Service | 196 | 237 | 460 | 24 | 59 | 5 | 52 | 11 | 2 | 96 | 26 | 44 | 8 | 113 | 149 | 1 | 3 | 5 | 6 | 1 | 1 | 5 | 2 | 11 | 2 | 1 | 1 | 1 | 1522 |

*NOTE: To find total of scheduled air carrier aircraft in domestic services, add 1, 2, 3, 4, 5 and 7. (1125 aircraft)*

*To find total of scheduled air carrier aircraft in international services, add 6 and 7. (561 aircraft)*

# Using this VICKERS PISTON TYPE PUMP

may be like finding **$66** Every 1500 Hours

**PF-3915-30 SERIES**
**CONSTANT DISPLACEMENT 3000 PSI**
*See* **BULLETIN A-5206**

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Add to this economy the other advantages of Vickers Piston Type Aircraft Pumps such as long life, easy overhaul, low weight and complete range of sizes (from .049 cu in./rev to 3.671 cu in./rev). Then write for new Bulletin A-5206 which describes the efficient Vickers Constant Displacement Piston Type Pumps.

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6246

*ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921*

## NEWS BRIEFS

The **Flying Tiger Line and Airwork Ltd.,** British independent carrier, are negotiating a working agreement, following the British government's authorization for Airwork to inaugurate trans-Atlantic all-cargo operations. Originally, Tigers reportedly were willing to **buy 49% of Airwork's stock,** but the plan was dropped when indications showed that CAB would not approve.

• •

Pan American World Airways has taken the position that all airline **courtesy flights have been and will be illegal** if a CAB enforcement office theory is adopted by the Board. The enforcement office has charged that Pan Am's carriage of guests aboard **non-revenue ferry flights** between New York and Miami constitutes "air transportation" within the meaning of the Act and is in violation of the Act.

• •

Lockheed Aircraft Corp. claims that **tire and brake life** on the F-94C can be approximately doubled through use of the "parabrake," following a series of tests on the parachute-brake. The chute is now standard on production models of the all-weather interceptor.

• •

A. V. Roe Ltd. **jet transport project has been named "Atlantic"** and will incorporate certain features of the Vulcan delta bomber. The jetliner is designed for **trans-Atlantic operation,** with cruise speed of 620 mph and ability to carry 11,000 gallons of fuel.

• •

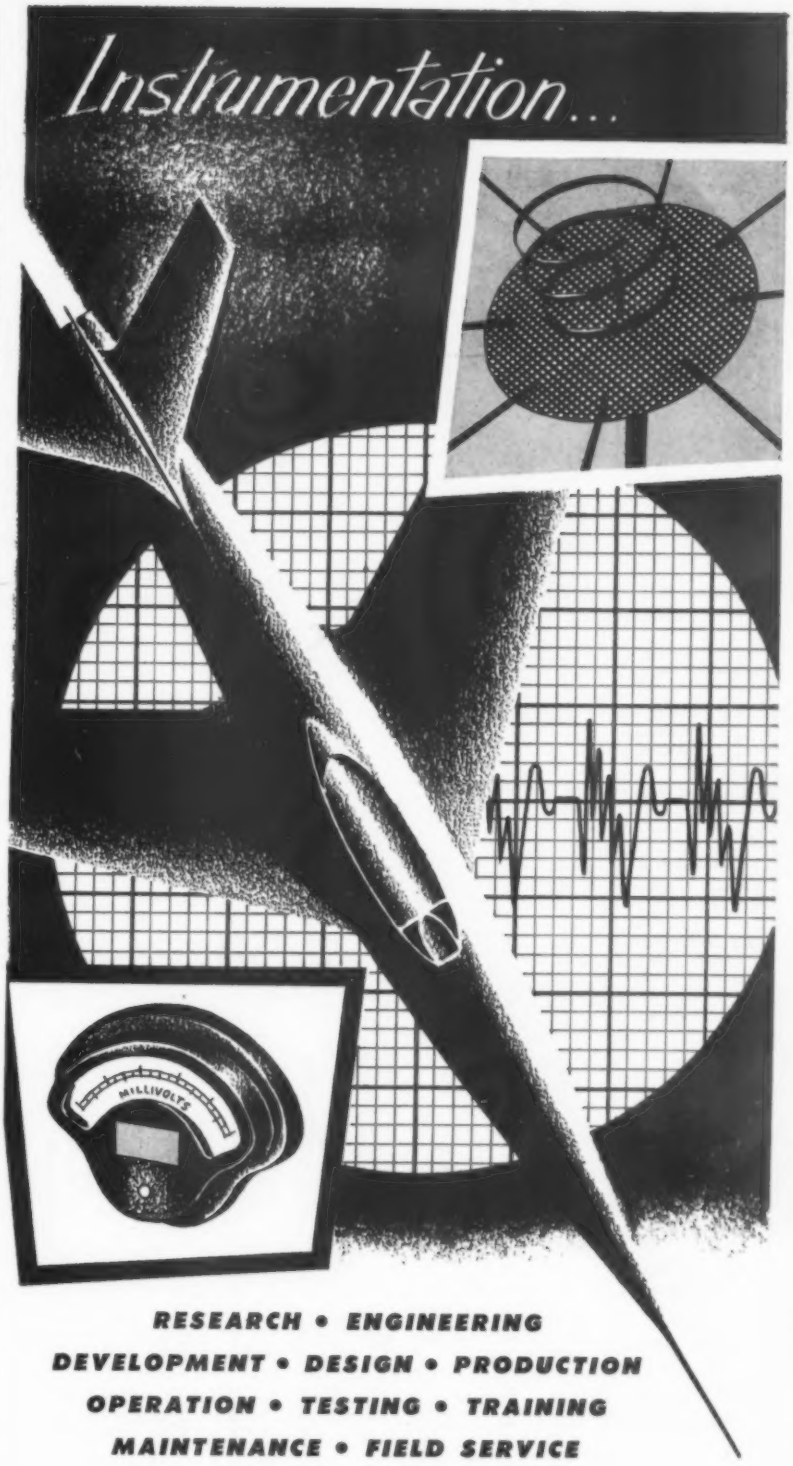
**Trans-Canada Air Lines** is reported to be "very pleased" with results of winter **service testing** of the prototype Vickers Viscount, recently carried out in Canada's far north and in the Montreal area, where the aircraft logged 113½ hours.

• •

**Air-India** has decided to take up its option on **two de Havilland Comet III's** for delivery in 1957, although the contract has not been signed.

• •

**Corporation Aircraft Owners Association** has set up two new committees—one for annual meeting arrangements, headed by **Ralph E. Piper,** chief pilot of Monsanto Chemical Company, who will also chairman the technical committee, and the second for awards and accounting under the direction of **Henry W. Boggess,** director of aviation for Sinclair in Tulsa. St. Louis, Mo., has been chosen as the site for CAOA's sixth annual meeting and forum in late October.

# HEAVY TRANSPORT AIRCRAFT SPECIFICATIONS

* Estimated
** May be decreased by enlarging wing area

| Co. & Model | Gross Weight (lbs.) | Oper. Empty Weight | Payload (lbs.) | Range (miles) | Fuel Cap (gals.) | Engines, Model | Take-off Horsepower | Rate of Climb (sealevel, fpm) | ROC (One Eng. Out, S.L. fpm) | Cruising Speed @ (mph.) | % Rated Normal Power | Seating Provisions (Range) | Wing Loading (lbs. sq. ft.) | Power Loading (lbs. BHP) | Stall Speed (mph) | Wing Span | Length | Height | Capacities: Main Cabin (cu. ft.) | Auxiliary Comp'ts Cabin (cu. ft.) | Underfloor Cargo Holds (cu. ft.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Military** | | | | | | | | | | | | | | | | | | | | | |
| **Boeing Airplane Co.** | | | | | | | | | | | | | | | | | | | | | |
| C-97 | 150,000 | 79,700 | 53,000 | | 7790 | P&W (4) R-4360-35 | 3,500 ea. | 1300 | 650 | 215 | 67 | 130 troops 79 lits. | 84.5 | 10.7 | 97 power on | 141'3" | 110'4" | 38'3" | 4,851 | 472 control cabin | 1345 |
| KC-97 | 150,000 | 80,400 or 86,400 | 53,000 | | 7790 | P&W (4) R-4360-59 | 3,500 ea. | 1300 | 650 | 215 | 67 | 130 troops 79 lits. | 84.5 | 10.7 | 97 power on | 141'3" | 110'4" | 38'3" | 4,851 | 472 control cabin | 1345 |
| **Chase Aircraft Co.** | | | | | | | | | | | | | | | | | | | | | |
| C-123B | 52,600 | 30,000 | 13,600 | 3,100 mi. | | P&W R-2800-99W | 2,500 | 1095 | 285 | 200 | 65 | 60+ | 43.0 | 13.8 | 75 | 110' | 75'9" | 34'1" | 3,570 | | |
| **Consolidated Vultee** | | | | | | | | | | | | | | | | | | | | | |
| T-29 | 43,575 | 29,747 | | 1500 | | P&W R-2800-97 | 2400 | 1230 | | 247 | | | 53.3 | 9.1 | 92 | 91'9" | 77'1" | 26'11" | | | |
| **Douglas Aircraft Co.** | | | | | | | | | | | | | | | | | | | | | |
| C-47 | 26,000 | 18,100 | 7,900 | 1,450 | 804 | P&W R-1830 | 1,200 | 1170 | 220 | 207 | 66.7 | | 26.3 | 10.8 | 70 | 95' | 63'9" | 16'11" | 1,245 | 38.7 | |
| C-54 | 62,000 | 38,900 | 13,100 | 4,200 | 3544 | P&W R-2000 | 1,450 | 1080 | 570 | 240 | 70.0 | | 42.3 | 10.7 | 82 | 117'6" | 93'5" | 27'7" | 3,238 | | 261 |
| R4D-8 | 36,800 | 19,500 | 12,900 | 3,340 | 1626 | WAC R-1820 | 1,475 | 1000 | 100 | 251 | 67.0 | | 38.1 | 12.5 | 77 | 90' | 67'9" | 18'3" | 1,589 | | |
| R6D-1 and C-118A | 103,000 | 53,850 | 27,130 | 4,060 | 5380 | P&W R-2800-52W | 2,500 | 1070 | 580 | 315 | 70.6 | | 70.5 | 10.3 | 95 | 117'6" | | 28'8" | 4,100 | | 453 |
| C-124C | 175,000 | 100,861 | 50,000 | 2,200 | 11,000 | P&W R-4360-63A | 3,800 | Classified | Classified | Classified | 2800 hp @ 7200' | 200 troops 127 lits. | 69.7 | 11.6 | Classified | 174'2" | 130' | 48'4" | 10,000 | | |
| YC-124B | 200,000 | 101,930 | 64,029 | Classified | 11,716 | P&W T-34-Pi | E.S.H.P. | Classified | Classified | Classified | | 200 troops | 80 | 9 | Classified | 174'1" | 129'7" | 51'3" | 10,000 | | |
| **Fairchild Aircraft Div.** | | | | | | | | | | | | | | | | | | | | | |
| C-82 | 54,000 | 31,288 | 17,800 | 2400 | 2614 | P&W R-2800-85 | 2100 | 950 | | 170 | 70 | 60 | 35.7 | 14.7 | 81 | 106'6" | 86'6" | 25'5" | 2,916 | | |
| C-119C | 73,150 | 39,942 | 27,500 | 1950 | 2624 | P&W R-4360-20W Wright | 3500 | 740 | | 200 | 70 | 67 | 50.5 | 10.5 | 108 | 109'3" | 86'6" | 26'3" | 3,150 | | |
| C-119G | 74,400 | 39,982 | 28,000 | 2280 | 2624 | R-3350-85 Wright | 3500 | 750 | | 200 | 70 | 67 | 51.4 | 10.6 | 108 | 109'3" | 95'8" | 26'3" | 3,150 | | |
| C-119H | 85,900 | 46,455 | 30,000 | 2440 | 2624 | R-3350-85 | 3500 | 722 | | 190 | 70 | 67 | 42.3 | 12.3 | 92 | 148' | 83' | 32' | 3,150 | | |
| XC-120 | 70,700 | 36,288 | 20,500 | 2480 | 2670 | P&W R-4360-20W | 3500 | 800 | | 167 | | | 48.9 | 10.1 | 104 | 109'3" | 74'8" | 24'10" | 3,200 | | |
| **Lockheed Aircraft Corp.** | | | | | | | | | | | | | | | | | | | | | |
| R6V | 184,000 | About 116,500 | About 40,000 | Over 6000 mi. max. | 9100 | P&W R-4360-22W | 3,500 | 745 | | 275 | | 168 | 51 | 13.1 | 78 | 189'1" | 156'1" | 50'45" | | | Lower deck 6870 |
| C121A | 107,000 | 58,879 | 28,121 | Over 5100 mi. | 5820 | 4 Wright R3350-75 | 2,500 | 1210 | 670 | About 325 | | About 44 | 64.9 | 10.7 | 91 | 123' | 95.3' | 23' | 3,750 | | 364 |
| 1249 | 150,000 | | | | | 4 P&W T-34 | 5500 | | | | | | | | | | | | | | |
| R7V-1 | 130,000 | Restr. | Restr. | Restr. | Restr. | 4 Wright R3350-34 | 3250 | Restr. | Restr. | Restr. | | 106 max. | | 10.0 | 80.5 | 123' | 116.2' | 24.8' | 4,875 | | 693 |
| C-130 | Restr. | Restr. | Restr. | Restr. | Restr. | 4 Allison T-56 Turboprops | 3750 | Restr. | Restr. | Restr. | | Restr. | Restr. | Restr. | Restr. | 132' | 95' | 38' | Restr. | Restr. | Restr. |
| **The Glenn L. Martin Co.** | | | | | | | | | | | | | | | | | | | | | |
| RM-1 Coast Guard | | | | | | R-2800-34W4 | | | | | | 28 Pass. | | | | | | | | | 5500 |
| **Civil** | | | | | | | | | | | | | | | | | | | | | |
| **Boeing Airplane Co.** | | | | | | | | | | | | | | | | | | | | | |
| B-377 | 145,800 | 83,500 | 30,000 | | 7,790 | P&W (4) R-4360 | 3,500 ea. | 1100 | 650 | 215 | 67 | 60-80 | 80.5 | 10.2 | 93 | 141'3" | 110' 4" | 38' 3" | 4,041 | 1,282 | 845 |
| **Consolidated Vultee Aircraft Corp.** | | | | | | | | | | | | | | | | | | | | | |
| 240 | 42,500 | 27,208 | 9,262 | 910 | 1000 | P&W R-2800-CA-18 | 2400 | | | 272 | 46 | 40 | 52 | 8.85 | | 91'9" | 74'8" | 26'11" | 1,651.2 | 344.78 | 88.0 |
| 340 | 47,000 | 28,795 | 13,000 | 1850 | 1750 | P&W R-2800-CB-16 | 2400 | | | 284 | 50 | 44-56 | 51.08 | 9.8 | 86 | 105'4" | 79'2" | 28'2" | 1,816.7 | 436.6 | 77.8 |
| **Curtiss** | | | | | | | | | | | | | | | | | | | | | |
| C-46 (Pass.) | 45,000 | 30,800 | 14,200 | 2000 | 1406 | P&W R-2800-51 or -75 | 2000 | 1295 | | 197 | 55 | 45-62 | 33.1 | 11.25 | 73.8 | 108' | 76'4" | | 2,300 | | 450 |
| C-46 (cargo) | 48,000 | 29,600 | 18,400 | 1930 | 1406 | P&W R-2800-51 or -75 | 2000 | 1150 | | 192 | 55 | | 35.3 | 12.0 | 76.1 | 108' | 76'4" | | 2,300 | | 450 |
| **Douglas Aircraft Co.** | | | | | | | | | | | | | | | | | | | | | |
| DC-3 | 25,200 | 16,500 | 8,700 | 1,400 | 820 | | | | | | | | | | | | | | | | |

* Estimated
** May be decreased by enlarging wing area

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Curtiss** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C-46 (Pass.) | 45,000 | 30,800 | 14,200 | 2000 | 1406 | CB-16 P&W R-2800 -51 or -75 | 2000 | 1295 | | 197 | 55 | 45-62 | 33.1 | 11.25 | 73.8 | 108' | 76'4" | | | 2,300 | | 450 | | | | | | | | | |
| C-46 (cargo) | 48,000 | 29,600 | 18,400 | 1950 | 1406 | P&W R-2800 -51 or -75 | 2000 | 1150 | | 192 | 55 | | 35.3 | 12.0 | 76.1 | 108' | 76'4" | | | 2,300 | | 450 | | | | | | | | | |
| **Douglas Aircraft Co.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DC-3 | 25,000 | 17,500 | 5,850 | 1,490 | 822 | P&W R1830 | 1,200 | 1240 | 250 | 207 | 67 | 60-80 | 80.5 | 10.2 | 93 | 141'3" | | 63' 9" | 16'11" | | 240 | | | | | | | | | |
| DC-3 | 28,000 | 17,500 | 5,850 | 1,490 | 822 | P&W R2000 | 1,450 | 880 | 430 | 240 | 70.0 | 44-66 | 49.9 | 12.6 | 82 | 117'6" | | 93' 5" | 27' 7" | | 281 | 261 | | | | | | | | |
| DC-3 | 28,000 | 17,500 | 5,850 | 1,490 | 822 | P&W R-2800- CB16 | 2,400 | 1100 | 580 | 317 | 75.0 | 58-80 | 66.4 | 10.1 | 91 | 117'6" | | 101' 6" | 28' 5" | | 168 | 373 | | | | | | | | |
| DC-6A | 107,000 | 51,300 | 30,400 | 4,980 | 5,526 | P&W R2800- CB17 | 2,500 | 1000 | 520 | 315 | 70.6 | | 73.1 | 10.7 | 95 | 117'6" | | 105' 2" | 28' 8" | | 4,433 | 567 | | | | | | | | |
| DC-6B | 100,000 | 55,350 | 23,900 | 4,095 | 4,322 | P&W R2800- CB16 | 2,400 | 1040 | 530 | 315 | 75.0 | 44-88 | 68.4 | 10.4 | 95 | 117'6" | | 105' 7" | 28' 8" | | 377 | 509 | | | | | | | | |
| DC-7 | 122,200 | 66,300 | 20,000 | 4,570 | 5,512 | Wright 972TCDA1 | 3,250 | 1140 | 605 | 360 | 73.5 | 65-90 | 83.5 | 9.4 | 99 | 117'6" | | 108'11" | 28' 7" | | 377 | 606 | | | | | | | | |
| **Lockheed Aircraft Corp.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 049D | 96,000 | 66,000 | 17,710 | 4,200 | 4,690 | 4 Wright 745 C18BA3 | 2,200 | | | 305 | | 43-81 | 58.2 | 10.9 | 83 | 123' | | 95.17' | 22.42' | | 3,750 | 445 | | | | | | | | |
| 649A | 98,000 | 66,700 | 17,710 | 4,370 | 4,690 | 4 Wright 749C18BD1 | 2,500 | 1370 | 740 | 328 | | 46-60 | 59.4 | 9.8 | 91 | 123' | | 95.17' | 22.42' | | 3,750 | 434 | | | | | | | | |
| 749 & 749A | 107,000 | 67,300 | 17,710 | 5,100 | 5,820 | 4 Wright 749C18BD1 | 2,500 | 1180 | 590 | 328 | | 46-57 | 64.9 | 10.7 | 91 | 123' | | 95.17' | 22.42' | | 3,750 | 434 | | | | | | | | |
| 1049 | 120,000 | 75,912 | 21,400 | 5,330 | 6,550 | 4 Wright 956C18CA1 | 2,700 | 1163 | 576 | 327 | | 88 | 72.8 | 11.1 | 94 | 123' | | 113.58' | 24.75' | | 4,800 | 680 | | | | | | | | |
| 1049D | 133,000 | 70,950 | 36,200 | 4,940 | 5,820 | 4 Wright 972TC18DA1 | 3,250 | 1125 | 540 | About 335 | (Cargo) | | 80.6 | 10.23 | 101 | 123' | | 113.58' | 25.75' | | 4,875 | 693 | | | | | | | | |
| 1049E | 133,000 | 70,062 | 24,255 | 4,820 | 6,550 | 4 Wright 972TC18DA1 | 3,250 | 1125 | 540 | About 350 | | 47-99 | 80.6 | 10.23 | 101 | 123' | | 113.58' | 24.75' | | 4,800 | 728 | | | | | | | | |
| **The Glenn L. Martin Co.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2-0-2 | 39,900 | 26,200 | 10,000 | 1,350 | 6,060 | R-2800 CA-18 | 2,400 | 2230 | 620 | 288 | | 36 | 46.2 | 8.30 | 80 | 93'3⅜" | | 71' 4" | 28' 7" | | | 3500 | | | | | | | | |
| 2-0-2A | 43,000 | 27,000 | 9,500 | 1,350 | 8,100 | R-2800 CB-16 | 2,400 | 2000 | 495 | 291 | | 36 | 49.9 | 8.96 | 82 | 93'3⅜" | | 71' 4" | 28' 7" | | | 4350 | | | | | | | | |
| 4-0-4 | 44,900 | 30,000 | 12,500 | 1,350 | 8,100 | R-2800 CB-16 | 2,400 | 1880 | 435 | 284 | | 40 | 52.1 | 9.18 | 82 | 93'3⅜" | | 74' 7" | 28' 7" | | | 5875 | | | | | | | | |
| **Foreign** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Blackburn and General Aircraft, Ltd.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Universal | 135,000 | 75,500 | 50,000 | 2,000 | 4,350 | Bristol Hercules (4) | 2,020 | 760 | 345 | 197 | 72.0 | 130 or 42 | 46.3 | 11.85 | 92 | 162 | | 99'2" | 37'6" | 4,000 | 2,000 | | | | | | | | | |
| **Bristol Airplane Co., Ltd.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 170 | 42,000 | 22,665 | 12,000 | 420 | 1405 | Br. Hercules (2) | 2000 | | | 310 | 47.5 | 56 | 28.2 | 10.5 | | 108' | | 68'4" | 26'3" | 2,300 | 240 | | | | | | | | | |
| **Britannia** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (175) | 140,000 | 69,500 | 25,000 | 4000 | | Br. Proteus (4) | 3780 | 1750 | | 350 | | 63-92 | 68.2 | 9.25 | | 140' | | 114' | 36'8" | | | | | | | | | | | | |
| **Canadair** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DC-4M | 80,200 | 46,800 | 14,000 | 3,530 | 3870 | R. R. "Merlin" | 4x1670 | 990 | 470 | 240 | 60 | 48 | 55.0 | 12.0 | 89 | 117.5 | | 93.6 | 27.5 | 2,800 | 209 | 269 | | | | | | | | |
| CL-21 | 32,500 | 21,400 | 7,000 | 1,400 | 790 | Cyclone 9HE | 2x1525 | 1,360 | 320 | 225 | 60 | 32 | 34.2 | 10.7 | 77 | 102.2 | | 67.1 | 25.3 | 1,294 | 331 | | | | | | | | | |
| **de Havilland Aircraft Co., Ltd.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Comet I | 105,000 | 48,000 | 12,500 | 1750 | 7200 | de Havilland Ghost (4) | 5000 thrust | 1000 | | 490 | | 36 | 52 | 5.25 | 82* | 115' | | 93' | 28' 4½" | 400 | 425 | 385 | | | | | | | | |
| Comet II | 115,000 | 54,000 | 13,500 | 2000-2300 | 8400 | Rolls-Royce Avon (4) | 6500+ thrust | | | 500 | | 44 | 59.6 | 4.4 | | 115' | | 96' | 28' | | | | | | | | | | | |
| Comet III | 14,500 | | 20,200 | 2700 | 9600+ | RR Avon 16 (4) | 9000 | | | 500 | | 58-76 | 72.0** | 4.03 | | 115' | | 111' | | | | | | | | | | | | |
| **Hurel-DuBois** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HD 31 | 28,887 | 19,335 | 7165 | 620 | 793 | Wright C7 BA1 | 800 | 12 | 2'3" | 183 | 158 | 63 | 36 | 1921 psi | 19.88 | 60 | 148' | | 72' | 22' 4" | 1,554 | 212 | | | | | | | | |
| HD 32 | 38,250 | 22,222 | 11,905 | 620 | 793 | P&W R-1830-92 | 1200 | 14 | 3 | 208 | 174 | 57 | 42 | 2468 psi | 16.15 | 68 | 148' | | 72' | 22' 4" | 1,554 | 212 | | | | | | | | |
| **SNCASE** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Languedoc | 52,247 | 32,837 | 9,880 | 7 hours @ 625 bhp | 1480 USG | P&W R1830-92 1200 bhp | | 500 | 390 | 175 | 525 bhp | 33-44 | 470 lbs. | 0.202 bhp | 102 | 96.6' | | 79.7' | 17.1' | 1710 approx. | 75 | 210 | | | | | | | | |
| **Breguet** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 763 | 105,816 | 73,565 | 19,470 | 11.5 hrs. | 3935 | P&W R2800- | 2400 | 1050 | 625 | 193 | 900 bhp | 59-107 | 493 | 0.200 | 101 | 141' | | 95.2' | 33' | 4280 | NIL | NIL | | | | | | | | |
| **SNCASE** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Armagnac | 170,800 | 97,500 | 30,850 | 2,255 | 8080 | P&W R4360 | 4x3500 3.13 | 656.6 | 509.6 | 285 | | 66 | 84 | 65.7 | 12.6 | 116.5' | 161.5 | 130.7' | 43.6' | 10,593 | | 1518 | | | | | | | | |
| **SNCASO** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SO 30 Bretagne | 44,300 | 31,080 | 9,640 | 1,740 | 1280 USG | P&W R2800 CA. 18 | 2x2.400 (lbs. thrust) | 1200 | 374 | 235 | | 43 | 46.4 | 8.96 | 97.5 | 88'2" | | 62'2" | 16'1" | | | 282 | | | | | | | | |
| **Vickers-Armstrong, Ltd.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Viscount 700 | 58,500 | 33,075 | 13,989 | 1500 | 2350 | Rolls-Royce Dart 3 (4) | 1400 shp +300 thrust | 1275 | | 320 | 50 | 48-62 | 60.7 | 8.0 | 97.5 | 93'8" | | 81'2" | 26'9" | 2,474 | | | | | | | | | | |
| Viscount 800 | 65,000 | 39,112 | 16,820 | 1100 at 10,300 | 2066 | Rolls-Royce Dart A5 (4) | 1540 | 1120 | 400 | 312 | | 66-82 | 67.5 | 9.6 | 106 | 93'8½" | | 94'6" | 26'9" | 3,132 | | | | | | | | | | |

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## NEWS BRIEFS

VARIG, Brazilian airline, has placed a **$7,000,000 order for three L-1049** Super Constellations with turbo-compound engines and spares with Lockheed Aircraft Corp. in anticipation of its license for the Brazil-New York route. Delivery is set for early 1955.

• •

Ozark Airlines is conducting negotiations with the Weesner family to acquire **controlling interest in Lake Central Airlines.** The Weesners, who were ousted from a management role by CAB, hold over 90% of the stock.

• •

French airline TAI will start **Douglas DC-6B operations** on May 19 over the Paris-Bordeaux-Marseilles-Bamako-Abidjan route. A second weekly flight will be added on June 4.

• •

**C. Hart Miller** has resigned his position as executive vice president and general manager of **Piasecki Helicopter Corp.** The post probably will not be filled.

• •

The Budget Bureau has turned down CAB's request for a **$150,000 fiscal 1954 budget increase,** a portion of which was to be applied to speed up action on route applications. The Board will receive the same $3,800,000 allotted in fiscal 1953.

• •

**Labor turnover** in the aircraft and parts industry reached 3.1 per 100 workers in January, an upswing from the 2.4 reported in December, according to the Bureau of Labor Statistics.

• •

Pioneer Air Lines has asked CAB to reverse its March 13 decision in which it refused to underwrite **Pioneer's Martin 2-0-2 operation** with higher mail pay. Barring such reversal, PAL has asked for revision of DC-3 mail pay fixed at $1,000,500 per year to include an additional $398,021 retroactive to April 1, 1952.

• •

The Guggenheim Aviation Center's 1953 **"Survey of Research Projects in the Field of Aviation Safety"** indicates that 200 new aviation safety research projects were begun in 1952, bringing the total underway to 1,100 representing an expenditure of **$60,000,000** annually. A poll among aviation authorities disclosed that better human engineering for aircraft should be top subject for safety research.

• •

**James S. Rockefeller** has been elected a director of **Pan American World Airways,** subject to CAB approval of interlocking relationships.

***American progress in aviation is respected wherever the compass points***

America's achievements in the world of aeronautics have built an enviable reputation that reaches to the four corners of the earth.

A prime factor in building this global reputation has been persistent research for better materials . . . better fabrication . . . and better production methods.

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| CAPITAL AIRLINES | CHICAGO & SOUTHERN AIR LINES | DELTA AIR LINES |
| EASTERN AIR LINES | EL-AL ISRAEL AIRLINES | |
| IBERIA—LINEAS ESPANOLAS | | |
| KLM ROYAL DUTCH AIRLINES | LINEA AEROPOSTAL VENEZOLANA | |
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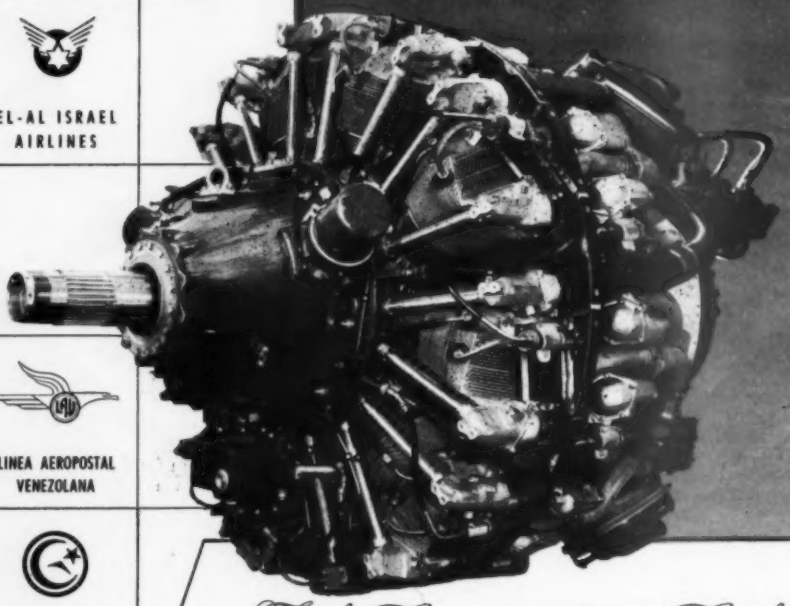
| SAA—SOUTH AFRICAN AIRWAYS | SEABOARD & WESTERN AIRLINES | TRANS-CANADA AIR LINES |
| TRANS WORLD AIRLINES | UNITED AIR LINES | "VARIG" BRAZILIAN AIRLINES |



*the Turbo Compound and the Cyclone 18*

Such unanimous selection of the Turbo Compound and the Cyclone 18 for Lockheed Constellations and Super Constellations and Douglas DC-7's is a tribute to Curtiss-Wright foresight in developing advanced power for high-speed, long-range economy.

# CURTISS-WRIGHT

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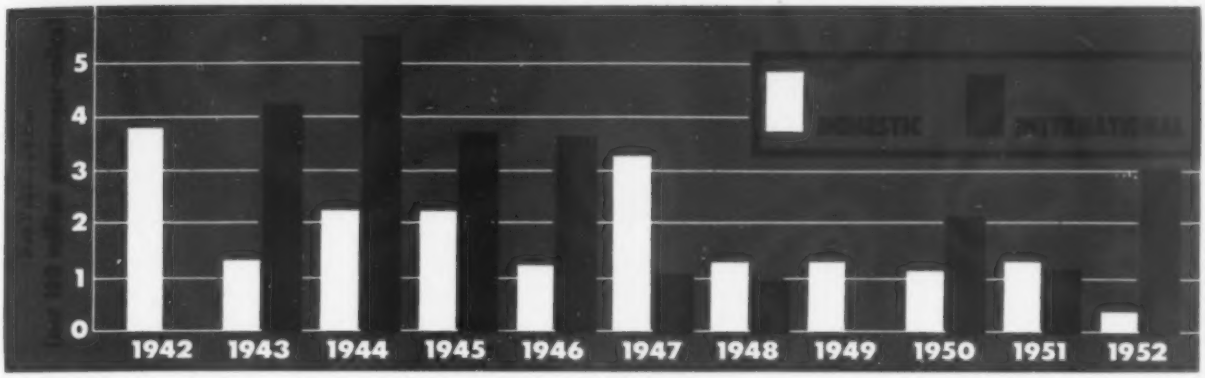
## Safety Record—Scheduled Domestic & International Carriers




# Domestic Airlines Achieve Fatality-Free Year

*By* JOSEPH S. MURPHY

ON FEBRUARY 11, 1953, the scheduled domestic airlines, including the trunk, local service, and territorial lines, marked the completion of one full year of fatality-free operation, with the airlines flying some 13.15 billion passenger-miles without a fatal accident. Air Transport Association President Emory S. Land accepted an award from the National Safety Council in recognition of the accomplishment.

In sharp contrast, one year earlier on February 11, 1952, the aviation safety picture could not have been more discouraging. On the day before, the third of a series of fatal accidents at Elizabeth, N. J., had brought to a sudden halt the operation of Newark Airport, sparking a display of public indignation throughout the New York metropolitan area that presented the airlines and aviation in general with the greatest crisis since air transportation became a big business.

But February 11, 1952, also proved to be the start of a record safety operation which saw the domestic airlines restore public confidence and finish out the year with a new low passenger fatality rate of 0.37 deaths per 100 million passenger-miles.

What is more significant, they flew 2,073,358 miles per fatal accident.

In 1951 the domestic rate was 1.3 deaths per 100 million passenger-miles, while only 87,344,951 plane-miles were flown per fatal accident.

In international operations the safety record was not as attractive: the fatality rate of 3.1 per 100 million passenger-miles stands as the highest since 1946, and represents a sharp increase over the rate of 1.2 for the year 1951. In 1952 the international carriers flew only 34,788,117 plane-miles per fatal accident, a poor showing when compared with the 99,001,300 flown in 1951.

The year 1952 also saw the large irregular air carriers reach new heights in safety. Flying 1.5 billion passenger-miles with but one fatal accident, the non-scheduled lines came through with a fatality rate of 2.0 deaths per 100 million passenger-miles, the best in their history and a far cry from the 19.7, 17.9, 3.8, and 7.3 rates experienced by the irregulars from 1948 through 1951.

Military Air Transport Service, despite two major accidents near the year's end which took 86 lives, recorded a fatality rate of 6.9 deaths per 100 million passenger-miles for 1952, a sharp drop in performance from the zero fatalities experienced by MATS in 1951. The 1.1 billion passenger-miles flown during 1952 brought the service's total to 3.2 billion passenger-miles since organized on June 1, 1948. • • •

## Fatal Accident Record—1952

| Accident-Operation | Fatalities | Probable Cause—CAB Findings |
|---|---|---|
| **Scheduled Domestic Operations** | | |
| CV-240—Elizabeth, N. J.<br>Jan. 22—American | Crew ..... 3<br>Pass. .....20<br>Other .... 7 | Not determined; insufficient evidence. |
| DC-6—Elizabeth, N. J.<br>Feb. 11—National | Crew ..... 3<br>Pass. .....26<br>Other .... 4 | Reversal in flight of # 3 propeller and subsequent feathering of # 4 propeller. |
| DC-6/Swift—Dallas, Tex.<br>June 28—American | Other .... 1 | Light plane pilot's imprudence in approach and errors in judgment on part of controller. |
| DC-3/Cessna—Richmond, Ind.<br>Dec. 15—Lake Central | Other .... 1 | Not yet announced (mid-air collision). |
| **Scheduled Cargo Operation** | | |
| C-46F—Jamaica, N. Y.<br>April 15—U. S. Airlines | Crew ..... 2 | Loss of control following sudden engine failure during attempted missed approach—failure due to deteriorated fuel feed valve diaphragm. |
| **International Scheduled Operation** | | |
| DC-4—San Juan, P. R.<br>April 11—Pan American | Pass. .....52 | Inadequate maintenance in not changing the # 3 engine, resulting in failure after take-off; pilot action in attempting to climb without all available power following engine failure. |
| B-377—Carolina, Brazil<br>April 29—Pan American | Crew ..... 9<br>Pass. .....41 | Not yet announced. |
| B-377—Rio de Janeiro, Brazil<br>July 29—Pan American | Pass. ..... 1 | Main cabin door opened in flight because not fully locked. |
| **Non-scheduled Operation** | | |
| DC-4—Sandspit, B. C.<br>Jan. 19—Northwest | Crew ..... 3<br>Pass. .....33 | High approach to airstrip and attempt to become airborne at insufficient airspeed; aircraft settled into water. |
| **Irregular Operations** | | |
| C-46—Whittier, Calif.<br>April 18—Robin Airlines | Crew ..... 3<br>Pass. .....26 | Pilot action in voluntarily descending below minimum altitude and attempting approach too low to clear the terrain. |
| **Others** | | |
| DC-3—Mt. Crillon, Alaska<br>Jan. 12—General Airways | Crew ..... 2 | Deviation from planned route due to improper navigation of the flight. |
| Cessna 170—Barrow, Alaska<br>Nov. 7—Wien, Alaska | Crew ..... 1<br>Pass. ..... 3 | Apparent stall during go-around after approach to Barrow Village airport. |

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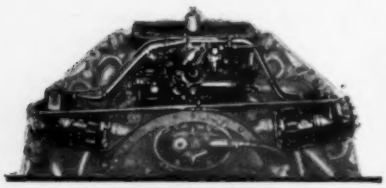

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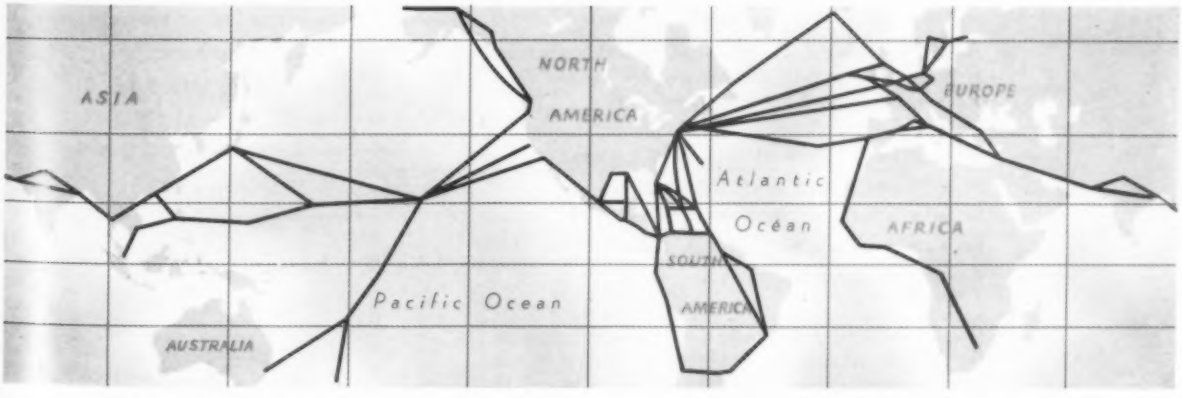


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# Traffic Rankings, U.S. Scheduled Airlines

| Rank | Airline | Rev. Pass. |
|---|---|---|
| 1. | AA | 5,153,329 |
| 2. | EAL | 3,944,775 |
| 3. | UAL | 3,452,475 |
| 4. | TWA | 2,573,245 |
| 5. | Capital | 2,011,264 |
| 6. | PAA | 1,426,409 |
| 7. | Braniff[1] | 1,061,608 |
| 8. | Delta | 975,505 |
| 9. | NWA | 948,320 |
| 10. | NAL | 785,681 |
| 11. | WAL[2] | 774,079 |
| 12. | C & S | 567,237 |
| 13. | NEA | 42,718 |
| 14. | Hawaiian | 363,541 |
| 15. | CAL | 352,007 |
| 16. | Colonial | 318,527 |
| 17. | MCA[3] | 295,076 |
| 18. | Piedmont | 244,702 |
| 19. | Allegheny | 183,986 |
| 20. | Pioneer | 183,271 |
| 21. | Trans-Pac. | 174,933 |
| 22. | Southwest | 165,057 |
| 23. | N. Central[4] | 153,077 |
| 24. | Frontier | 127,398 |
| 25. | Southern | 121,375 |
| 26. | Panagra | 120,903 |
| 27. | W. Coast[5] | 114,937 |
| 28. | Caribair | 110,873 |
| 29. | Mohawk[5] | 110,514 |
| 30. | Ozark | 84,463 |
| 31. | TTA | 78,214 |
| 32. | Central | 47,167 |
| 33. | Bonanza | 43,705 |
| 34. | Lake Cen. | 33,213 |
| 35. | Empire[7] | 28,617 |
| 36. | Wiggins | 3,178 |
| 37. | Mid-West[8] | 866 |
| 38. | Fly. Tiger | ..... |
| 39. | HAS | ..... |
| 40. | Los Ang. | ..... |
| 41. | New York[9] | ..... |
| 42. | Riddle | ..... |
| 43. | Slick | ..... |

| Rank | Airline | Rev. Pass. Miles (000 Omitted) |
|---|---|---|
| 1. | AA | 2,927,388 |
| 2. | UAL | 2,402,893 |
| 3. | TWA | 2,324,318 |
| 4. | EAL | 2,020,627 |
| 5. | PAA | 1,807,069 |
| 6. | NWA | 721,756 |
| 7. | Capital | 637,579 |
| 8. | NAL | 483,820 |
| 9. | Delta | 444,149 |
| 10. | Braniff | 428,979 |
| 11. | WAL | 298,933 |
| 12. | C & S | 239,324 |
| 13. | CAL | 139,000 |
| 14. | Panagra | 133,288 |
| 15. | Colonial | 100,217 |
| 16. | MCA | 87,891 |
| 17. | NEA | 84,198 |
| 18. | Piedmont | 50,435 |
| 19. | Pioneer | 48,886 |
| 20. | Hawaiian | 48,383 |
| 21. | Frontier | 34,025 |
| 22. | Southwest | 31,331 |
| 23. | Allegheny | 26,798 |
| 24. | N. Central | 25,238 |
| 25. | Trans-Pac. | 23,112 |
| 26. | Southern | 20,820 |
| 27. | Mohawk | 19,220 |
| 28. | W. Coast | 18,674 |
| 29. | TTA | 18,361 |
| 30. | Ozark | 14,147 |
| 31. | Bonanza | 10,751 |
| 32. | Caribair | 8,912 |
| 33. | Central | 6,689 |
| 34. | Empire | 5,622 |
| 35. | Lake Cen. | 5,481 |
| 36. | Wiggins | 313 |
| 37. | Mid-West | 128 |
| 38. | Fly. Tiger | ..... |
| 39. | HAS | ..... |
| 40. | Los Ang. | ..... |
| 41. | New York | ..... |
| 42. | Riddle | ..... |
| 43. | Slick | ..... |

| Rank | Airline | Mail Ton-Miles |
|---|---|---|
| 1. | UAL | 21,676,407 |
| 2. | AA | 17,564,185 |
| 3. | TWA | 16,994,382 |
| 4. | PAA | 16,936,944 |
| 5. | EAL | 6,216,643 |
| 6. | NWA | 5,017,993 |
| 7. | Braniff | 2,232,837 |
| 8. | Delta | 1,942,163 |
| 9. | Capital | 1,915,607 |
| 10. | NAL | 1,383,763 |
| 11. | WAL | 1,358,444 |
| 12. | C & S | 887,452 |
| 13. | Panagra | 715,392 |
| 14. | CAL | 506,188 |
| 15. | MCA | 276,508 |
| 16. | Colonial | 157,157 |
| 17. | NEA | 144,047 |
| 18. | Pioneer | 125,893 |
| 19. | Frontier | 109,740 |
| 20. | N. Central | 94,696 |
| 21. | Southern | 86,387 |
| 22. | Piedmont | 85,823 |
| 23. | Southwest | 84,432 |
| 24. | TTA | 63,684 |
| 25. | Allegheny | 63,071 |
| 26. | Los Ang. | 43,257 |
| 27. | Ozark | 40,578 |
| 28. | Mohawk | 34,005 |
| 29. | Central | 33,001 |
| 30. | Hawaiian | 30,026 |
| 31. | HAS | 28,966 |
| 32. | W. Coast | 20,254 |
| 33. | Trans-Pac. | 19,987 |
| 34. | Bonanza | 16,563 |
| 25. | Lake Cen. | 15,495 |
| 36. | Empire | 14,929 |
| 37. | Caribair | 11,984 |
| 38. | Mid-West | 3,406 |
| 39. | New York | 2,754 |
| 40. | Wiggins | 1,100 |
| 41. | Fly. Tiger | ..... |
| 42. | Riddle | ..... |
| 43. | Slick | ..... |

| Rank | Airline | Express Ton-Miles |
|---|---|---|
| 1. | UAL | 10,261,307 |
| 2. | AA | 9,938,123 |
| 3. | TWA | 6,760,849 |
| 4. | EAL | 4,001,298 |
| 5. | Capital | 2,541,846 |
| 6. | NWA | 2,005,482 |
| 7. | Delta | 1,245,149 |
| 8. | Braniff | 1,091,350 |
| 9. | C & S | 952,881 |
| 10. | NAL | 655,406 |
| 11. | WAL | 570,146 |
| 12. | CAL | 200,464 |
| 13. | NEA | 182,696 |
| 14. | MCA | 169,385 |
| 15. | N. Central | 138,341 |
| 16. | Allegheny | 118,638 |
| 17. | Colonial | 107,608 |
| 18. | Piedmont | 95,688 |
| 19. | Southern | 88,403 |
| 20. | Frontier | 72,666 |
| 21. | Ozark | 70,331 |
| 22. | Mohawk | 57,472 |
| 23. | Lake Cen. | 51,979 |
| 24. | Hawaiian | 49,897 |
| 25. | Southwest | 44,406 |
| 26. | Pioneer | 44,197 |
| 27. | TTA | 30,707 |
| 28. | W. Coast | 19,082 |
| 29. | Bonanza | 11,514 |
| 30. | Central | 11,497 |
| 31. | Empire | 9,824 |
| 32. | Trans-Pac. | 5,028 |
| 33. | Wiggins | 1,781 |
| 34. | Caribair | ..... |
| 35. | Fly. Tiger | ..... |
| 36. | HAS | ..... |
| 37. | Los Ang. | ..... |
| 38. | Mid West | ..... |
| 39. | New York | ..... |
| 40. | PAA | ..... |
| 41. | Panagra | ..... |
| 42. | Riddle | ..... |
| 43. | Slick | ..... |

| Rank | Airline | Freight Ton-Miles |
|---|---|---|
| 1. | PAA | 51,617,079 |
| 2. | Slick | 48,579,907 |
| 3. | AA | 46,956,205 |
| 4. | Fly. Tiger | 37,867,510 |
| 5. | UAL | 27,335,303 |
| 6. | TWA | 22,945,359 |
| 7. | NWA | 11,301,368 |
| 8. | Riddle | 10,778,490 |
| 9. | EAL | 7,336,950 |
| 10. | NAL | 5,477,613 |
| 11. | Delta | 4,275,185 |
| 12. | Capital | 3,935,243 |
| 13. | Braniff | 3,437,559 |
| 14. | C & S | 2,432,414 |
| 15. | Panagra | 2,372,480 |
| 16. | Hawaiian | 1,195,244 |
| 17. | WAL | 953,678 |
| 18. | CAL | 776,040 |
| 19. | Frontier | 420,358 |
| 20. | MCA | 352,386 |
| 21. | NEA | 257,927 |
| 22. | Colonial | 232,916 |
| 23. | Pioneer | 177,045 |
| 24. | Piedmont | 147,652 |
| 25. | Southwest | 117,784 |
| 26. | TTA | 81,686 |
| 27. | Trans-Pac. | 65,362 |
| 28. | W. Coast | 42,597 |
| 29. | Mohawk | 42,340 |
| 30. | Caribair | 30,092 |
| 31. | Bonanza | 26,180 |
| 32. | Central | 22,690 |
| 33. | Lake Cen. | 3,017 |
| 34. | Allegheny | ..... |
| 35. | Empire | ..... |
| 36. | HAS | ..... |
| 37. | Los Ang. | ..... |
| 38. | Mid West | ..... |
| 39. | N. Central | ..... |
| 40. | New York | ..... |
| 41. | Ozark | ..... |
| 42. | Southern | ..... |
| 43. | Wiggins | ..... |

| | | | | | |
|---|---|---|---|---|---|
| TOTALS | 27,562,245 | 15,698,755 | 97,047,143 | 41,605,441 | 291,593,629 |

[1] *Braniff's figures include operations of local service segment (route 106) which has been operated by Braniff since August 16, 1952, effective date of merger with MCA.*

[2] *Western's figures include operations of former subsidiary, Inland Air Lines, Inc., which company was dissolved and operations merged with WAL on April 9, 1952.*

[3] *Figures for MCA are for the period from January 1 through August 15, 1952, and include operations of local service route 106 through that date when company merged with Braniff Airways.*

[4] *Formerly Wisconsin Central Airlines. Change in name was effective December 16, 1952.*

[5] *Formerly Robinson Airlines Corp. Change in name was effective August 23, 1952.*

[6] *West Coast Airlines and Empire Air Lines merger was effective August 4, 1952, West Coast being the surviving company.*

[7] *Empire's figures are through July, 1952, only. See above footnote.*

[8] *Mid-West Airlines terminated its local service operations May 15, 1952, due to non-renewal of certificate by CAB.*

[9] *New York Airways began operations October 15, 1952.*

NOTE: *In above tabulation domestic and international operations of companies have been combined. Mail ton-miles include air parcel post.*

## Milestones

Inauguration of the "Los Angeles San Diego Airline" by Ryan Airlines marked first regularly scheduled year 'round passenger airline in the U. S.

March 1, 1925

• • •

First transcontinental through air service from New York City to Los Angeles, Calif., inaugurated by Transcontinental and Western Air, Inc.

October 25, 1930


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## Air Traffic Both Ways Between U. S.-Canada and Europe, 1952

| | AF | BOAC | EL AL | KLM | LAI | PAA | SABENA | SAS | SWISSAIR | TCA | TWA | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **First Class Flights** | | | | | | | | | | | | |
| Revenue Passengers | 17,166 | 43,287 | 769 | 23,961 | 2,955 | 76,596 | 4,348 | 11,614 | 5,828 | 6,020 | 50,694 | 243,238 |
| Seating Capacity | 22,368 | 66,562 | 1,509 | 33,667 | 6,531 | 111,461 | 7,936 | 18,726 | 8,564 | 9,528 | 74,798 | 361,650 |
| % Seats Used | 76.7 | 65.0 | 50.9 | 71.1 | 45.2 | 68.7 | 54.7 | 62.0 | 68.0 | 63.1 | 67.7 | 67.2 |
| Passenger Flights | 633 | 1,118 | 29 | 835 | 139 | 2,037 | 340 | 463 | 208 | 247 | 1,869 | 7,918 |
| Average Passenger per Flight | 27.1 | 38.7 | 26.5 | .... | 21.2 | 37.6 | ..... | ..... | 28.0 | 24.3 | 27.1 | ..... |
| All-cargo Flights | 2 | 12 | 0 | 257 | 0 | 128 | 10 | 75 | 0 | 0 | 33 | 517 |
| Cargo (tons) | 383.8 | 1,055.5 | 16.7 | 1,926.0 | 92.4 | 2,001.1 | 201.4 | 417.7 | 173.2 | 160.7 | 937.4 | 3,674.2 |
| Mail (tons) | 245.9 | 602.3 | 5.3 | 152.2 | 51.3 | 1,402.8 | 81.3 | 56.2* | 85.9 | 64.3 | 926.7 | 3,674.2 |
| **Tourist Flights** | | | | | | | | | | | | |
| Revenue Passengers | 15,977 | 22,273 | 4,930 | 15,410 | 2,433 | 41,061 | 8,866 | 17,832 | 4,238 | 16,015 | 38,312 | 187,347 |
| Seating Capacity | 22,200 | 33,232 | 7,666 | 21,560 | 3,177 | 59,939 | 13,434 | 25,152 | 5,844 | 18,718 | 49,827 | 260,749 |
| % Seats Used | 71.9 | 67.0 | 64.3 | 71.4 | 76.5 | 68.5 | 66.0 | 70.8 | 72.5 | 85.5 | 76.8 | 71.8 |
| Passenger Flights | 373 | 494 | 125 | 347 | 69 | 751 | 305 | 388 | 105 | 468 | 859 | 4,284 |
| Average Passenger per Flight | 42.8 | 45.0 | 39.4 | ..... | 35.2 | 54.6 | ..... | ..... | 40.3 | 34.2 | 44.6 | ..... |
| Cargo (tons) | 169.7 | 145.2 | 41.8 | 181.1 | 36.9 | 131.7 | 26.5 | 125.1 | 52.2 | 353.1 | 385.2 | 1,648.5 |
| Mail (tons) | 70.5 | 61.6 | 23.9 | 24.6 | 24.5 | 163.2 | 26.2 | 23.4* | 27.8 | 130.3 | 350.2 | 926.2 |
| **Combined First Class and Tourist** | | | | | | | | | | | | |
| Revenue Passengers | 33,143 | 65,560 | 5,699 | 39,371 | 5,388 | 117,657 | 13,214 | 29,446 | 10,066 | 22,035 | 89,006 | 430,585 |
| Seating Capacity | 44,568 | 99,794 | 9,175 | 55,227 | 9,708 | 171,400 | 21,370 | 43,878 | 14,408 | 28,246 | 124,625 | 622,399 |
| % Seats Used | 74.3 | 65.7 | 62.1 | 71.2 | 55.5 | 68.6 | 61.8 | 67.1 | 69.8 | 78.0 | 71.4 | 69.1 |
| Passenger Flights | 1,006 | 1,612 | 154 | 1,182 | 208 | 2,788 | 645 | 851 | 313 | 715 | 2,728 | 12,202 |
| Average Passenger per Flight | 32.9 | 40.6 | 37.0 | ..... | 25.9 | 42.2 | ..... | ..... | 32.1 | 30.8 | 32.6 | 35.2 |
| Cargo (tons) | 553.5 | 1,200.7 | 58.5 | 2,107.1 | 129.3 | 2,132.8 | 227.9 | 542.8 | 225.4 | 513.8 | 1,322.6 | 9,014.4 |
| Mail (tons) | 316.4 | 663.9 | 29.2 | 176.8 | 75.8 | 1,566.0 | 107.5 | 79.6* | 113.7 | 194.6 | 1,276.9 | 4,600.4 |

** SAS mail figure is eastbound only. Westbound total is not available.*

# Foreign Lines Take North Atlantic Lead

*By* Eric Bramley

BOOSTED by inauguration of tourist service last May 1, revenue passenger traffic carried both ways across the Atlantic in 1952 on the regular schedules of the 11 U. S. and foreign airlines reached a new high of 430,585, an increase of 30.9% over the 1951 total of 328,764. The increase in 1951 over 1950 was only 5.6%.

(The 1952 figures are for the 52 weeks from December 30, 1951, to December 27, 1952. They are compared with calendar 1951. Traffic totals, unless otherwise specified, are for regular schedules only, between the U. S. and Canada to European points and beyond. There were about 16,000 passengers on charter flights in 1952).

Last year marked the first time that the two U. S. airlines—Pan American World Airways and TWA—carried less than 50% of the total business. They surrendered the lead to the nine foreign lines, which hauled 223,922 passengers, or 52%, against 206,663, or 48%, for the U. S.

PAA and TWA last year carried more than half (52.3%) of the first-class traffic, with a total both ways of 127,290 passengers, against 115,948 (47.7%) for the foreign lines. However, the latter took a substantial lead in the tourist field, with 107,974 passengers (57.7%) against 79,373 (42.3%) for the U. S.

Two of the foreign lines, Trans-Canada and El Al, switched all their service to tourist class on May 1.

A comparison of the number of flights operated in 1951 and 1952 is not possible because some of the carriers flew trips, carrying first-class and tourist passengers on the same planes.

Cargo tonnage both ways was 9,014.4, only a 9% increase, against a 21.4% gain in 1951 over 1950.

### Cargo Lead

The foreign lines maintained their lead in this field, carrying 5,559 tons, or 61.6%, against the U. S. 3,455.4, or 38.4%. The foreign share in 1951 was 63.6%. The 1952 total is somewhat distorted by the fact that Scandinavian Airlines System carried about 237 tons on flights that were technically listed as charters (and thus not included in the scheduled total) because they were under a lease arrangement with Transocean Air Lines.

PAA continued to lead in the cargo field, with 2,132.8 tons, nosing out KLM Royal Dutch Airlines which carried 2,107.1 tons.

Scheduled all-cargo flights in 1952 totaled 517 both ways, a 48.5% increase over 1951. The foreign lines operated 356, or 68.8%, of the total.

The 1952 figures also show:

• **Airline passenger travel** was 52.8% of the total carried on Atlantic steamships (all classes). The airline total in this case includes charter passengers. In 1951, air was 47.7% of steamship, and in 1950, 45.8%.

• **There were 622,399 seats** available both ways, and 69.1% of them were sold. First-class seats totaled 361,650 (67.2% used), tourist seats totaled 260,749 (71.8% used).

• **The first six passenger carriers,** in order, were PAA, TWA, BOAC, KLM, Air France and SAS.

• **Total eastbound** first-class and tourist traffic was 199,762, a 35% gain over 1951's 147,903. The U. S. lines carried 61,308 first-class (53.5% of total) and 36,410 tourist (42.6%) for a total of 97,718 (48.9%), against the foreign lines' 53,096 first-class (46.5%) and 48,948 tourist (57.4%), totaling 102,044 (51.1%).

The U. S. lines offered 92,696 first-class seats eastbound and 53,788 tourist, while the foreign carriers had available 86,022 first-class and 74,844 tourist.

Eastbound cargo tonnage totaled 4,146.2, a 2.4% decrease from 1951. Foreign lines operated 219 all-cargo flights in this direction and hauled 2,785.7 tons, or 67.2% of total. PAA and TWA flew 81 such trips and carried 1,360.5 tons (32.8%).

• **Westbound first-class** and tourist traffic totaled 230,823, up 27.6% over 1951's 180,861. U. S. lines hauled 65,982 first-class (51.2%), 42,963 tourist (42.1%), or a total of 108,945 (47.2%). Foreign lines' figures were 62,852 (48.8%), 59,026 (57.9%) and 121,878 (52.8%), respectively.

U. S. first-class seats offered westbound were 93,563, tourist were 55,078, totaling 108,945. Foreign totals were 89,369, 76,139 and 121,878, respectively.

Westbound cargo totaled 4,868.2 tons, up 21.1% over 1951 (and against a 2.4% decrease eastbound). PAA and TWA hauled 2,049.9 tons (43%) and flew 80 all-cargo trips (36.8%).

# Air Traffic Westbound Between U. S.-Canada and Europe, 1952

## First Class Flights

| | AF | BOAC | EL AL | KLM | LAI | PAA | SABENA | SAS | SWISSAIR | TCA | TWA | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Revenue Passengers | 9,284 | 22,185 | 475 | 13,278 | 1,635 | 39,813 | 2,182 | 6,436 | 2,972 | 4,405 | 26,169 | 128,834 |
| Seating Capacity | 11,287 | 33,490 | 781 | 17,073 | 3,288 | 55,685 | 4,048 | 10,296 | 4,282 | 4,824 | 37,878 | 182,932 |
| % Seats Used | 82.2 | 66.2 | 60.8 | 77.7 | 49.7 | 71.4 | 53.9 | 62.5 | 69.4 | 91.3 | 69.0 | 70.4 |
| Passenger Flights | 315 | 563 | 15 | 422 | 70 | 1,018 | 171 | 241 | 104 | 125 | 946 | 3,990 |
| Average passengers per flight | 29.4 | 39.4 | 31.6 | ..... | 23.3 | 39.1 | ..... | ..... | 28.5 | 35.2 | 27.6 | ..... |
| All-Cargo Flights | 1 | 1 | 0 | 113 | 0 | 64 | 1 | 21 | 0 | 0 | 16 | 217 |
| Cargo (tons) | 174.3 | 533.2 | 4.3 | 916.0 | 57.0 | 1,160.7 | 88.3 | 172.0 | 112.5 | 93.0 | 617.2 | 3,928.5 |
| Mail (tons) | 202.4 | 502.0 | 2.8 | 98.6 | 35.1 | 330.5 | 54.5 | NA | 64.6 | 5.5 | 301.1 | 1,597.1 |

*NOTE 1: Figures for El Al and TCA are from the first of the year to May 1, when both carriers discontinued first-class flights and operated exclusively tourist.*

## Tourist Flights

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Revenue Passengers | 9,227 | 11,953 | 2,830 | 8,346 | 1,195 | 22,602 | 4,871 | 9,734 | 2,201 | 8,669 | 20,361 | 101,989 |
| Seating Capacity | 11,560 | 16,644 | 3,889 | 10,688 | 1,564 | 30,975 | 7,047 | 12,659 | 2,770 | 9,318 | 25,003 | 132,117 |
| % Seats Used | 79.8 | 71.8 | 72.7 | 78.0 | 76.4 | 72.9 | 69.1 | 76.9 | 79.4 | 93.0 | 81.4 | 77.1 |
| Passenger Flights | 193 | 246 | 64 | 172 | 34 | 389 | 161 | 195 | 52 | 233 | 431 | 2,170 |
| Average passengers per flight | 47.8 | 48.6 | 44.2 | ..... | 35.1 | 58.1 | ..... | ..... | 42.3 | 37.2 | 47.2 | ..... |
| Cargo (tons) | 70.5 | 74.5 | 12.3 | 107.3 | 19.0 | 80.5 | 13.5 | 63.1 | 27.2 | 235.3 | 236.5 | 939.7 |
| Mail (tons) | 53.2 | 56.9 | 11.5 | 11.8 | 14.0 | 56.0 | 18.9 | NA | 21.0 | 9.1 | 117.0 | 369.4 |

*NOTE 1: Air France figures include estimate for one week.*
*2: KLM, SABENA and SAS operated some combination first class-tourist flights. Therefore, average passengers per flight are not shown, and are not included in the total column.*
*3: Because of combination flights by three carriers, the "Passenger Flights" total is not a true figure.*

## Combined First Class and Tourist

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Revenue Passengers | 18,511 | 34,138 | 3,305 | 21,624 | 2,830 | 62,415 | 7,053 | 16,170 | 5,173 | 13,074 | 46,530 | 230,823 |
| Seating Capacity | 22,847 | 50,134 | 4,670 | 27,761 | 4,852 | 86,660 | 11,095 | 22,955 | 7,052 | 14,142 | 62,881 | 315,049 |
| % Seats Used | 81.0 | 67.9 | 70.7 | 77.8 | 58.3 | 72.0 | 63.5 | 70.4 | 73.3 | 92.4 | 73.9 | 73.2 |
| Passenger Flights | 508 | 809 | 79 | 594 | 104 | 1,407 | 332 | 436 | 156 | 358 | 1,377 | 6,160 |
| Average passengers per flight | 36.4 | 42.2 | 41.8 | ..... | 27.2 | 44.3 | ..... | ..... | 33.1 | 36.5 | 33.7 | ..... |
| Cargo (tons) | 244.8 | 607.7 | 16.6 | 1,023.3 | 76.0 | 1,241.2 | 101.8 | 235.1 | 139.7 | 328.3 | 853.7 | 4,868.2 |
| Mail (tons) | 255.6 | 558.9 | 14.3 | 110.4 | 49.1 | 386.5 | 73.4 | NA | 85.6 | 14.6 | 418.1 | 1,966.5 |

*NA—Not available*

# Air Traffic Eastbound Between U. S.-Canada and Europe, 1952

## First Class Flights

| | AF | BOAC | EL AL | KLM | LAI | PAA | SABENA | SAS | SWISSAIR | TCA | TWA | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Revenue Passengers | 7,882 | 21,102 | 294 | 10,683 | 1,320 | 36,783 | 2,166 | 5,178 | 2,856 | 1,615 | 24,525 | 114,404 |
| Seating Capacity | 11,081 | 33,072 | 728 | 16,594 | 3,243 | 55,776 | 3,888 | 8,430 | 4,282 | 4,704 | 36,920 | 178,718 |
| % Seats Used | 71.1 | 63.8 | 40.3 | 64.3 | 40.7 | 65.9 | 55.7 | 61.4 | 66.7 | 34.3 | 66.4 | 64.0 |
| Passenger Flights | 318 | 555 | 14 | 413 | 69 | 1,019 | 169 | 222 | 104 | 122 | 923 | 3,928 |
| Average passengers per flight | 24.7 | 38.0 | 21.0 | ..... | 19.1 | 36.0 | ..... | ..... | 27.4 | 13.2 | 26.5 | ..... |
| All-Cargo Flights | 1 | 11 | 0 | 144 | 0 | 64 | 9 | 54 | 0 | 0 | 17 | 300 |
| Cargo (tons) | 209.5 | 522.3 | 12.4 | 1,010.0 | 35.4 | 840.4 | 113.1 | 245.7 | 60.7 | 67.7 | 320.2 | 3,437.4 |
| Mail (tons) | 43.5 | 100.3 | 2.5 | 53.6 | 16.2 | 1,072.3 | 26.8 | 56.2 | 21.3 | 58.8 | 625.6 | 2,077.1 |

*NOTES: 1: KLM, SABENA and SAS operated some combination first class-tourist flights. Therefore, average passengers per flight are not shown, and are not included in the total column.*
*2: Figures for El Al and TCA are from the first of the year to May 1, when both carriers discontinued first class flights and operated exclusively tourist.*
*3: Because of combination flights by three carriers, the "Passenger Flights" total is not a true figure.*

## Tourist Flights (Begun May 1)

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Revenue Passengers | 6,750 | 10,320 | 2,100 | 7,064 | 1,238 | 18,459 | 3,995 | 8,098 | 2,037 | 7,346 | 17,951 | 85,358 |
| Seating Capacity | 10,640 | 16,588 | 3,777 | 10,872 | 1,613 | 28,964 | 6,387 | 12,493 | 3,074 | 9,400 | 24,824 | 128,632 |
| % Seats Used | 63.4 | 62.2 | 55.6 | 64.9 | 76.7 | 63.7 | 62.5 | 64.8 | 66.2 | 78.1 | 72.3 | 66.3 |
| Passenger Flights | 180 | 248 | 61 | 175 | 35 | 362 | 144 | 193 | 53 | 235 | 428 | 2,144 |
| Average passengers per flight | 37.5 | 41.6 | 34.4 | ..... | 35.3 | 50.9 | ..... | ..... | 38.4 | 31.2 | 41.9 | ..... |
| Cargo (tons) | 99.2 | 70.7 | 29.5 | 73.8 | 17.9 | 51.2 | 13.0 | 62.0 | 25.0 | 117.8 | 148.7 | 708.8 |
| Mail (tons) | 17.3 | 4.7 | 12.4 | 12.8 | 10.5 | 107.2 | 7.3 | 23.4 | 6.8 | 121.2 | 233.2 | 556.8 |

## Combined First Class and Tourist

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Revenue Passengers | 14,632 | 31,422 | 2,394 | 17,747 | 2,558 | 55,242 | 6,161 | 13,276 | 4,893 | 8,961 | 42,476 | 199,762 |
| Seating Capacity | 21,721 | 49,660 | 4,505 | 27,466 | 4,856 | 84,740 | 10,275 | 20,923 | 7,356 | 14,104 | 61,744 | 307,350 |
| % Seats Used | 67.3 | 63.2 | 53.1 | 64.6 | 52.6 | 65.1 | 59.9 | 63.4 | 66.5 | 63.5 | 68.7 | 64.9 |
| Passenger Flights | 498 | 803 | 75 | 588 | 104 | 1,381 | 313 | 415 | 157 | 357 | 1,351 | 6,042 |
| Average passengers per flight | 29.4 | 39.1 | 39.1 | ..... | 24.6 | 40.0 | ..... | ..... | 31.1 | 25.1 | 31.4 | ..... |
| Cargo (tons) | 308.7 | 593.0 | 41.9 | 1,083.8 | 53.3 | 891.6 | 126.1 | 307.7 | 85.7 | 185.5 | 468.9 | 4,146.2 |
| Mail (tons) | 60.8 | 105.0 | 14.9 | 66.4 | 26.7 | 1,179.5 | 34.1 | 79.6 | 28.1 | 180.0 | 858.8 | 2,633.9 |

# Selected International Traffic Figures

| Airline | | Rev. Pass. Seat-Miles Available | Rev. Pass. Miles Flown | Revenue Pass. Load Factor | Rev. Pass. Carried | Ton-Miles Available, Pass. Cargo & Mail | Cargo Carried (Tons) | Cargo Ton-Miles Flown | Mail Carried (Tons) | Mail Ton-Miles Flown | Overall Rev. Load Factor |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Aer Lingus (Ireland) | [1] 1951 | 80,255,000 | 60,352,000 | 74% | 265,805 | 9,329,000 | 3,820 | 779,000 | 1,151 | 195,000 | 70% |
| | [1] 1952 | 94,187,000 | 65,637,000 | 69% | 289,364 | 10,995,000 | 3,741 | 764,000 | 1,464 | 249,000 | 64% |
| Aerovias Brasil | 1951 | 185,801,317 | 84,807,722 | 45.6% | 203,709 | 8,101,054 | 3,884 | 2,329,184 | 130 | 149,939 | n.a. |
| | 1952 | 203,700,714 | 107,190,079 | 52.6% | 222,694 | 9,391,431 | 4,058 | 2,524,769 | 186 | 238,957 | n.a. |
| Aerovias Ecuatorianas (Ecuador) | 1951 | n.a. | n.a. | n.a. | 47,544 | n.a. | 2,925 | n.a. | n.a. | n.a. | n.a. |
| | 1952 | 16,169,595 | 7,184,344 | 44.4% | 58,049 | 1,646,651 | 3,971 | 549,728 | 507 | 36,696 | 70.3% |
| Air France | 1951 | 1,131,026,461 | 783,000,791 | 69% | 970,979 | 167,668,345 | 34,869 | 25,740,649 | 8,583 | 11,022,965 | 72% |
| | 1952 | 1,363,080,042 | 905,350,732 | 66% | 1,056,230 | 194,340,403 | 40,559 | 31,951,085 | 9,142 | 12,977,292 | 74% |
| Air Services of India | 1951 | 19,202,169 | 11,387,918 | 59.3% | 39,583 | 2,301,038 | 1,000 | 343,802 | 90 | 30,570 | 63.8% |
| | 1952 | 17,999,856 | 10,301,840 | 57.2% | 33,455 | 1,970,054 | 977 | 320,981 | 91 | 31,623 | 68.1% |
| Airways (India) Ltd. | 1951 | 65,136,918 | 37,672,138 | 57.8% | 111,472 | 12,714,979 | 15,341 | 4,847,633 | 269 | 108,818 | 67.8% |
| | 1952 | 70,878,048 | 36,454,415 | 51.4% | 108,146 | 13,810,256 | 17,791 | 5,746,085 | 531 | 192,260 | 68.1% |
| Ansett Airways (Australia) | 1951 | 71,614,480 | 43,141,444 | 57% | 133,319 | n.a. | 2,955 | n.a. | 6 | n.a. | n.a. |
| | 1952 | 80,597,272 | 48,821,612 | 63% | 147,946 | n.a. | 2,508 | n.a. | 4 | n.a. | n.a. |
| AVIANCA (Aerovias Nacionales de Colombia) | 1951 | 253,798,762 | 154,770,555 | 61% | 592,381 | 51,544,801 | 70,239 | 19,357,742 | 455 | n.a. | 69% |
| | 1952 | 268,391,102 | 177,989,547 | 66% | 614,574 | 53,483,622 | 72,377 | 20,470,812 [3] | 494 | 150,903 | 71% |
| Bharat Airways (India) | 1951 | n.a. | 25,385,363 | n.a. | 72,298 | 9,451,376 | 14,120 | 2,952,668 | 371 | 151,951 | 59.8% |
| | 1952 | n.a. | 27,788,207 | n.a. | 78,443 | 10,555,685 | 18,147 | 3,358,268 | 449 | 189,118 | 59.5% |
| Braathens S.A.F.E. (Norway) | 1951 | 40,148,629 | 19,839,304 | 49.4% | 8,125 | 6,162,585 | 411 | n.a. | 8 | n.a. | 69.7% |
| | 1952 | 45,093,947 | 19,398,420 | 43% | 10,980 | 6,435,090 | 318 | n.a. | 17 | n.a. | 61.5% |
| British European Airways | 1951 | 461,395,349 | 306,026,565 | 66.3% | 1,121,439 | 56,194,900 | 13,117 | 4,851,609 | 6,149 | 2,320,847 | 64% |
| | 1952 | 552,404,210 | 356,760,085 | 64.6% | 1,337,941 | 66,576,940 | 15,634 | 5,660,799 | 6,432 | 2,549,987 | 62.9% |
| British Overseas Airways Corp. | 1951 | 1,190,396,943 | 746,486,323 | 62.7% | 239,090 | 183,530,292 | 6,280 | 25,387,561 | 2,762 | 14,962,482 | 65.2% |
| | [2] 1952 | 1,332,848,399 | 857,629,986 | 64.3% | 269,637 | 201,571,158 | 6,226 | 24,153,956 | 3,091 | 16,172,114 | 64.8% |
| Canadian Pacific Air Lines | 1951 | n.a. | 127,358,760 | n.a. | 184,415 | n.a. | 2,850 | 1,234,099 | 967 | 454,202 | n.a. |
| | 1952 | 183,320,021 | 94,939,830 | 51.8% | 189,755 | 17,863,284 | 2,791 | 1,393,299 | 1,073 | 598,327 | 52.4% |
| Central African Airways | 1951 | 54,544,666 | 35,659,196 | 65.4% | 70,777 | 6,474,549 | 664 | 418,733 | 346 | 243,848 | 63.1% |
| | 1952 | 72,321,090 | 45,124,281 | 62.4% | 94,216 | 8,546,343 | 775 | 506,182 | 389 | 308,070 | 60.4% |
| Civil Air Transport (CAT) (Formosa) | 1951 | n.a. | 6,822,942 | n.a. | 39,046 | 2,422,504 | 1,436 | 577,397 | 57 | [3] | 43.6% |
| | 1952 | 28,003,096 | 13,545,412 | 48.3% | 60,233 | 4,403,545 | 2,458 | 1,058,220 | 139 | 53,065 | 52.8% |
| Deccan Airways Ltd. (India) | 1951 | 46,941,216 | 27,664,382 | 54.1% | 52,833 | 5,052,094 | 1,156 | 597,675 | 1,117 | 707,531 | 79.9% |
| | 1952 | 59,616,900 | 29,340,626 | 44.1% | 53,162 | 6,592,660 | 1,427 | 733,384 | 1,948 | 1,250,855 | 74.2% |
| El Al Israel Airlines | 1951 | 81,448,000 | 46,892,000 | 57.6% | 19,231 | 11,418,000 | 551 | 1,191,300 | 75 | 225,500 | 59.3% |
| | 1952 | 100,406,000 | 60,984,000 | 60.7% | 21,904 | 13,791,800 | 845 | 1,729,200 | 108 | 347,600 | 65.4% |
| Empresa Guatemalteca de Aviacion (Aviateca) (Guatemala) | 1951 | n.a. | 9,790,444 | n.a. | 79,488 | n.a. | 3,829 | n.a. | 6 | n.a. | n.a. |
| | 1952 | n.a. | 5,950,216 | n.a. | 67,201 | n.a. | 4,187 | n.a. | 7 | n.a. | n.a. |
| Garuda Indonesian Airways | 1951 | 130,705,135 | 98,911,599 | 75.7% | 290,876 | 17,191,296 | 14,271 | 5,468,880 | 989 | 1,038,467 | 77.2% |
| | 1952 | 131,908,658 [2] | 93,655,189 | 71% | 284,476 | 18,627,855 | 8,681 | 3,433,021 | 1,018 | 1,202,949 | 70.7% |
| Hong Kong Airways | 1951 | 3,522,640 | 1,474,000 | 41.2% | 3,350 | 496,971 | 251 | 110,240 | 13 | 5,764 | 56.6% |
| | 1952 | 5,633,100 | 2,788,500 | 49.5% | 5,070 | 816,750 | 232 | 127,582 | 20 | 10,842 | 54% |
| Japan Air Lines Co. | [4] 1951 | 9,830,550 | 7,294,081 | 74.2% | 18,348 | 1,051,416 | 19 | 9,264 | 38 | 11,894 | 57% |
| | 1952 | 55,747,284 | 42,895,480 | 76.9% | 102,893 | 5,711,066 | 213 | 101,262 | 243 | 82,485 | 61.7% |
| Lineas Aereas Costarricenses (Costa Rica) | 1951 | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. |
| | 1952 | 35,556,395 | 16,912,309 | 47.5% | 91,856 | 6,043,742 | 6,265 | 1,526,990 | 152 | 12,518 | 51.5% |
| Lineas Aereas Nacionales (LANSA) (Colombia) | 1951 | 81,646,277 | 39,317,870 | 48.1% | 206,586 | 13,880,603 | 15,392 | 5,243,994 | 1,976 | 211,197 | 65.4% |
| | 1952 | 65,525,696 | 42,880,116 | 65.4% | 235,036 | 10,138,603 | 12,773 | 3,418,085 | 1,519 | 521,678 | 74.7% |
| Loftleidir, The Icelandic Airlines | 1951 | 4,540,777 | 1,625,849 | 35.7% | 15,428 | 749,688 | 367 | 69,187 | 32 | 7,693 | n.a. |
| | 1952 | 15,427,725 | 4,782,363 | 31% | 2,599 | n.a. | 101 | 319,579 | 7 | 18,393 | n.a. |
| Malayan Airways Ltd. | 1951 | 39,284,470 | 28,968,840 | 73.7% | 119,740 | 4,736,593 | 1,413 | 454,125 | 461 | 139,456 | 73.2% |
| | 1952 | 47,274,680 | 32,263,150 | 68.2% | 138,372 | 5,753,799 | 2,471 | 691,804 | 533 | 156,497 | 69.9% |
| New Zealand National Airways | 1951 | 87,245,003 | 74,886,809 | 85.8% | 294,689 | 11,544,188 | 5,547 | 1,456,540 | 865 | 258,879 | 77.5% |
| | 1952 | 96,470,545 | 76,877,447 | 79.7% | 301,231 | 12,154,451 | 3,219 | 921,524 | 580 | 170,045 | 70.3% |
| Orient Airways Ltd. (Pakistan) | [5] 1951 | 71,654,256 | 45,670,511 | 63.7% | 99,134 | 8,431,341 | 3,470 | 1,364,251 | 127 | 126,945 | 66.3% |
| | [2] [5] 1952 | 75,663,412 | 48,573,865 | 64.2% | 99,500 | 9,535,279 | 3,277 | 1,783,316 | 223 | 259,670 | 67.7% |
| Queen Charlotte Airlines (Canada) | 1951 | 15,496,763 | 9,184,772 | 59% | 73,411 | 1,886,656 | 473 | 65,125 | 12 | 2,076 | n.a. |
| | 1952 | 12,710,493 | 6,101,037 | 48% | 66,073 | 1,361,163 | 296 | 40,433 | 75 | 7,623 | n.a. |
| Scandinavian Airlines System | 1951 | 641,286,470 | 369,222,297 | 57.6% | 506,462 | 88,749,276 | 8,706 | 9,723,418 | 2,786 | 2,899,719 | 58.7% |
| | 1952 | 731,307,854 | 417,495,597 | 57.1% | 583,457 | 98,520,768 | 9,731 | 9,346,471 | 3,436 | 3,792,720 | 58.3% |
| Sudan Airways | 1951 | n.a. | 3,131,486 | n.a. | 6,908 | 556,616 | 88 | 50,994 | 24 | 9,128 | 67% |
| | 1952 | n.a. | 4,014,770 | n.a. | 8,842 | 644,453 | 121 | 64,216 | 16 | 13,412 | 73% |
| Swissair | 1951 | 192,694,724 | 123,131,618 | 63.9% | 281,748 | 23,502,322 | 3,894 | 2,194,440 | 1,421 | 762,921 | 68.4% |
| | 1952 | 213,067,334 | 138,740,371 | 65.1% | 292,341 | 26,136,780 | 4,258 | 2,344,746 | 1,926 | 1,098,417 | 69.9% |
| Trans-Canada Air Linees | 1951 | 140,446,655 | 94,770,514 | 67.4% | 973,337 | 21,013,714 | 5,633 | 5,454,350 | 5,232 | 4,468,093 | 61.4% |
| | 1952 | 152,675,080 | 107,784,155 | 70.6% | 1,132,518 | 23,692,601 | 8,095 | 7,084,054 | 5,441 | 4,843,052 | 59.6% |
| Viacao Aerea Sao Paulo (VASP) (Brazil) | 1951 | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. |
| | 1952 | 92,320,487 | 45,793,493 | 53.4% | 222,048 | 8,381,014 | 2,459 | 4,659 | 34 | 11,196 | 53.3% |
| Transports Aeriens Intercontinentaux TAI (France) | 1951 | n.a. | 81,009,726 | n.a. | 24,684 | 13,620,647 | 2,043 | 4,344,127 | 51 | 165,324 | 73% |
| | 1952 | n.a. | 81,780,445 | n.a. | 22,959 | 14,618,194 | 2,177 | 5,211,749 | 45 | 135,295 | 75% |
| West African Airways | 1951 | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. |
| | 1952 | 24,639,396 | 11,366,234 | 46% | 51,735 | 3,174,821 | n.a. | 226,420 | n.a. | 103,932 | 54.7% |

[1] *1951 figs. are from Apr. 1, 1950 to March 31, 1951; 1952 figs. are from Apr. 1, 1951 to March 31, 1952.*
[2] *Estimated figure(s)*
[3] *Included in cargo ton-miles flown*
[4] *Commenced operations Oct. 25, 1951*
[5] *Includes non-scheduled services.*

*Source: American Aviation Survey*

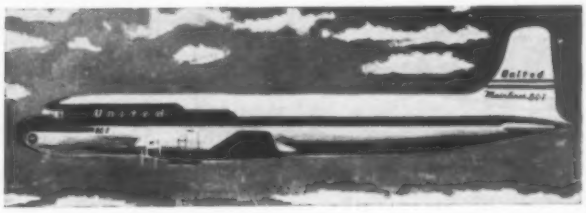
*NOTE: All ton figures are short tons*

**Douglas's DC-4** is converted version of military C-54 originally designed for commercial service but side-tracked to meet war requirements. A limited number of DC-4's were built for commercial use after World War II. Powered by four Pratt & Whitney R-2000 engines rated at 1350 horsepower.

**Boeing's Stratocruiser,** now operated by four airlines, is predecessor of the military KC-97 series and is only double-deck airliner in wide use. Fifty-five B-377's were built. They are powered by four Pratt & Whitney R-4360 engines rated at 3500 horsepower each.

## Four-Engine Transports

**Douglas DC-6B** is stretched-fuselage version of earlier DC-6. Total of 433 DC-6 type aircraft have been sold, including 124 DC-6's, 27 DC-6A cargo versions, and 174 DC-6B's. Powered by four Pratt & Whitney R-2800 engines rated at 2400 horsepower each.




**Douglas DC-7** is a stretched version of the Douglas DC-6B, powered by the R-3350 Wright Turbo-Compound engines rated at 3500 horsepower each. Principal advantage of the configuration is estimated cruising speed of 363 miles per hour. Fifty-eight DC-7's have been ordered. Prototype is scheduled to fly in May, with 15 deliveries slated by year's end.

**Lockheed's L-749** Constellation is the conventional "Connie," growing out of the earlier military 049 Constellation and the basis for the compound-engine-powered L-1049C. More than 460 military and civil versions of the Constellation have been built or are on order.

**Canadair DC-4M** is Canadian version of Douglas DC-4, incorporating some DC-6 characteristics. Powered by Rolls-Royce Merlin engines, the DC-4M, or Northstar, is in service with the RCAF and Trans-Canada Air Lines.

**Lockheed's L-1049** Super Constellation is a stretched version of the standard L-749, with 18 feet added to the fuselage length. First 25 for TWA and Eastern had conventional piston engines, but 68 more with Wright Turbo-Compound R-3350 engines are now on order.

## International Aircraft Designations

| | |
|---|---|
| Afghanistan | YA |
| Argentina | LV |
| Australia | VH |
| Austria | OE |
| Belgium | OO |
| Bolivia | CB, CP |
| Brazil | PP, PT |
| Bulgaria | LZ |
| Burma | XZ, XY |
| Canada | CF |
| Ceylon | CY |
| Chile | CC |
| China | B, XT |
| Colombia | HK |
| Costa Rica | TI |
| Cuba | CU |
| Czechoslovakia | OK |
| Denmark | OY |
| Dominican Republic | HI |
| Ecuador | HC |
| Egypt | SU |
| El Salvador | YS |
| Ethiopa | ET |
| Finland | OH |
| France | F |
| Germany | O |
| Greece | SX |
| Guatemala | TG |
| Haiti | HH |
| Hungary | HA |
| Iceland | TF |
| India | VT |
| Indonesia | PK |
| Iran | EP |
| Iraq | YI |
| Ireland | EI, EJ |
| Italy | I |
| Japan | J |
| Jordan | TJ |
| Lebanon | LR |
| Liberia | LI |
| Luxembourg | LX |
| Mexico | XA, XB, XC |
| Morocco | CN |
| Netherlands | PH |
| Netherlands Antilles | PJ |
| Surinam | PZ |
| New Zealand | ZK, ZL, ZM |
| Nicaragua | AN |
| Norway | LN |
| Pakistan | AP |
| Panama | HP |
| Paraguay | ZP |
| Peru | OB |
| Philippine Republic | PI |
| Poland | SP |
| Portugal | CS |
| Portuguese Colonies | CR |
| Saudi Arabia | HZ |
| Soviet Union | URSS |
| Spain | EC |
| Sweden | SE |
| Switzerland | HB |
| Syria | YK |
| Thailand | HS |
| Turkey | TC |
| Union of South Africa | ZS, ZT, ZU |
| United Kingdom | G |
| Colonies & Protectorates | VP, VQ, VR |
| United States | N |
| Uruguay | CX |
| Venezuela | YV |
| Yugoslovia | YU |

## Air-Rail Traffic Comparison*

JANUARY-DECEMBER, 1952

| | | Rail Revenue Passenger-Miles (thousands) | Air Revenue Passenger-Miles (thousands) | Air Traffic (% of Rail) | Pullman Revenue Passenger-Miles (thousands) | Air Traffic (% of Pullman) |
|---|---|---|---|---|---|---|
| Jan. | 1952 | 2,666,304 | 885,225 | 33.2 | 1,017,406 | 87.0 |
| | 1951 | 2,558,313 | 759,000 | 29.7 | 1,106,759 | 68.6 |
| Feb. | 1952 | 2,300,659 | 832,866 | 36.2 | 900,959 | 92.4 |
| | 1951 | 2,023,980 | 696,310 | 34.4 | 851,476 | 81.8 |
| Mar. | 1952 | 2,332,714 | 962,243 | 41.2 | 881,024 | 109.2 |
| | 1951 | 2,305,468 | 872,769 | 37.9 | 905,123 | 96.4 |
| Apr. | 1952 | 2,283,772 | 1,034,830 | 45.3 | 767,043 | 134.9 |
| | 1951 | 2,157,780 | 871,000 | 40.4 | 820,116 | 107.2 |
| May | 1952 | 2,414,146 | 978,162 | 40.5 | 785,458 | 124.5 |
| | 1951 | 2,237,960 | 897,287 | 40.1 | 783,731 | 114.5 |
| June | 1952 | 2,675,608 | 1,160,855 | 43.4 | 825,536 | 140.6 |
| | 1951 | 2,707,433 | 968,125 | 35.8 | 868,855 | 111.4 |
| July | 1952 | 2,703,295 | 1,128,222 | 41.7 | 719,808 | 156.7 |
| | 1951 | 2,787,379 | 955,260 | 34.3 | 801,933 | 119.1 |
| Aug. | 1952 | 2,771,980 | 1,194,792 | 43.1 | 744,801 | 160.4 |
| | 1951 | 2,902,437 | 1,000,687 | 34.5 | 829,638 | 120.6 |
| Sept. | 1952 | 2,283,460 | 1,131,902 | 49.6 | 718,571 | 157.5 |
| | 1951 | 2,530,748 | 976,302 | 38.6 | 809,436 | 120.6 |
| Oct. | 1952 | 2,077,875 | 1,173,301 | 56.5 | 703,301 | 166.8 |
| | 1951 | 2,279,002 | 962,050 | 42.2 | 812,060 | 118.5 |
| Nov. | 1952 | 2,036,692 | 1,013,911 | 49.8 | 655,670 | 154.6 |
| | 1951 | 2,301,939 | 851,025 | 37.0 | 809,342 | 105.2 |
| Dec. | 1952 | 2,715,940 | 1,031,132 | 38.0 | 784,144 | 131.5 |
| | 1951 | 2,955,172 | 869,466 | 29.4 | 826,240 | 105.2 |
| **Totals** | 1952 | 29,262,313 | 12,630,657 | 43.2 | 9,503,967 | 132.9 |
| | 1951 | 29,749,578 | 10,679,281 | 35.9 | 10,225,525 | 104.4 |

** Rail figures exclude commutation travel.*

# Air Travel Led Pullman by 32% in 1952

### Airline traffic exceeds first-class rail by three billion revenue passenger-miles.

Continuing the trend that was established last year, the scheduled airlines of the United States pulled farther away from first-class and Pullman travel in the number of revenue passenger-miles operated, and in 1952 air travel exceeded Pullman by more than three billion revenue passenger-miles.

Percentage-wise, air travel in 1952 amounted to 132.9% of Pullman-first class travel, while in 1951, air travel was only 104%.

During the entire year of 1952, Pullman exceeded air only during the months of January and February. By year's end, air travel, over 12.6 billion revenue passenger-miles, was up 18% over its 1951 figure of 10.6 billion, while Pullman travel slipped seven per cent. from 10.2 to 9.5 billion.

In comparing air with all rail travel (except the commuter services) via the nation's Class I railroads, substantial gains also accrue to air.

In 1951, air travel amounted to 35.9% of rail; in 1952 the percentage increased to 43.2%. All rail travel, reflecting the drop in Pullman and first class, was down 1.6% in 1952, going to 28.2 billion revenue passenger-miles from 29.7 billion.

Air passenger revenues of the domestic scheduled airlines, boosted by 1952's gains in traffic, came within $120,746,516 of the year's total rail passenger revenues, $817,066,446 (exclusive of commuter revenue). A percentage comparison of the two years finds air passenger revenue, amounting to 73.1% of rail passenger revenue in 1951, had climbed to 85.0% in 1952. • • •

## Milestones

First non-stop trans-continental flight, 2520 miles in 26 hours 50 minutes flying time, from New York to San Diego, Calif., flown in a Fokker T2-Liberty 375. Pilots were Lt. O. G. Kelly and Lt. J. A. Macready.

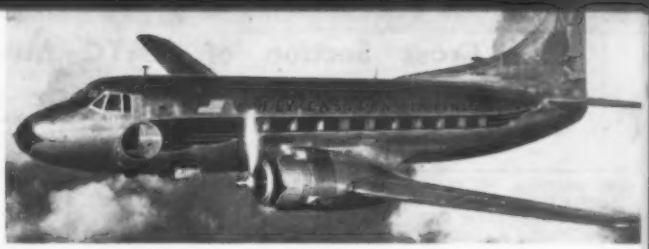
May 2, 1923

• • •

Trans-continental train-plane service was inaugurated providing 48-hour service.

July 7, 1929

**Convair's 340** is the improved version of the earlier Convair 240. Powered by Pratt & Whitney R2800 engines, rated at 2400-2500 horsepower. One hundred and eighty-six 340's have been ordered by 21 airlines, and an additional group will be built. There have been "hundreds" of the military versions of the Convair 240 and 340 produced.



**Martin 4-0-4** was produced for two airlines, Eastern and TWA, then production was discontinued other than for two Coast Guard versions of the plane. Ninety-eight planes were produced, 56 for Eastern and 40 for TWA, which supplemented its fleet with 12 Martin 2-0-2A's, souped up versions of the earlier M-2-0-2.

**Douglas's DC-3** remains the standard aircraft of the local service operators in the U.S., is also used widely by trunk airlines and by all types of foreign airlines. There are 460 DC-3's in use by U. S. airlines.

## Twin-Engine Transports

**SNCASO SO 30** Bretagne is France's twin-engine, 43-passenger transport. It is powered by Pratt & Whitney R-2800 CA18 engines. Gross weight is 44,300 pounds and cruising speed 255 miles per hour.

**Curtiss C-46's** have been a mainstay of the non-scheduled airline industry and continue to serve both the military services and scheduled airlines in some capacities. There are 149 in service among U.S. airlines today. Flying Tigers ship shown has FTL-engineered jet engine to improve emergency performance.

## Cross Section of NATC Membership Report for 1952

| NATC OPERATOR | State | No. Aircraft | No. Air Taxi Trips | Rev. Pass.-Miles | Gross Pass. Rev. | Average Pass. Load | Av. Trip Length | Freight Trips | Gross Freight Revenue |
|---|---|---|---|---|---|---|---|---|---|
| Air Services, Inc. | Ohio | 3 | 48 | 9,475 | $ 2,230.45 | 1.7 | 150 mi. | 3 | $100.00 |
| Airway Flight Service* | Mo. | 5 | 43 | 25,028 | 3,754.33 | 3 | 283 | 7 | 810.50 |
| American Aviation Co. | Iowa | 7 | 128 | 80,000 | 11,511.76 | 3 | 312 | 0 | ..... |
| Avex, Inc.* | Fla. | 3 | 1 | 328 | 318.60 | 3 | 490 | 4 | 500.00 |
| BACA Airlines | Mo. | .... | ..... | 187,442 | 21,827.08 | .... | 107 | .... | 383.31 |
| Bohon Aviation School* | Va. | 2 | 25 | 20,700 | 432.00 | .... | 80 | 3 | ..... |
| Brennan Air Service* | Ill. | 4 | 53 | 16,946 | 2,424.35 | 2 | 183 | 9 | 940.25 |
| Butte Aero Sales & Service* | Mont. | 4 | 6 | 1,080 | 129.60 | 2 | 60 | 0 | 0 |
| Byerly Aviation, Inc.* | Ill. | 4 | 4 | 480 | 145.00 | 2 | 60 | 0 | 0 |
| Cape Cod Flying Service | Mass. | 6 | 900 | 350,000 | 47,724.00 | 3 | 60 | 0 | 0 |
| Cape & Islands Flight Service* | Mass. | 2 | 2 | ..... | 38.00 | 1 | 10 | 0 | 0 |
| Cape Central Airways* | Mo. | 1 | 10 | 1,049 | 92.43 | 1 | 105 | 11 | 180.43 |
| Central Maine Flying Service | Maine | 3 | 52 | ..... | 572.00 | 1 | 35 | 0 | 0 |
| Cranston Air Service | Calif. | 3 | 10 | 2,000 | 400.00 | 2 | 100 | 2 | 290.00 |
| Dixie Aviation Co.* | S. C. | 2 | 32 | 12,041 | 1,688.51 | 1.9 | 109 | 0 | 0 |
| Elliott Flying Service | Iowa | 6 | 306 | 238,856 | 25,227.08 | 2 | 100 | 31 | 2,897.55 |
| Ferns Flying Service | N. H. | 1 | 10 | 750 | ..... | 2 | 75 | 0 | 0 |
| Graham Flying Service | Iowa | 3 | 148 | 59,200 | 10,646.55 | 2 | 200 | 1 | 35.00 |
| Gran-Aire, Inc. | Wis. | 5 | 76 | 13,680 | 2,280.00 | 3 | 40 | 12 | 300.00 |
| Hunter Flying Service | Iowa | 8 | 971 | 388,498 | 52,275.00 | 3 | 200 | 100 | 6,000.00 |
| Kalamazoo Flying Service* | Mich. | 3 | 146 | 16,100 | 5,685.00 | 2 | 110 | 5 | 195.00 |
| Lehigh Aviation Service | Penna. | 3 | 17 | 5,770 | 600.00 | 2 | 94 | 1 | 48.00 |
| Lynch Flying Service* | Mont. | 6 | 2 | 450 | ..... | 1 | 112 | 0 | 0 |
| Maine Instrument Flight School* | Maine | 2 | 10 | 750 | 145.00 | 2 | 50 | 0 | 0 |
| Mamer-Shreck Air Transport | Wash. | 3 | 108 | 28,080 | 7,209.00 | 3 | .... | 15 | 400.00 |
| Midwestern Aero Service* | Ill. | 2 | 49 | 2,988 | 266.15 | .7 | 91 | 30 | 541.88 |
| Norman Larson Co. | Calif. | 2 | 4 | 1,004 | 315.00 | 1.75 | 58 | 0 | 0 |
| Northeast Aviation Co.* | Maine | 2 | 250 | ..... | 10,000.00 | 2 | 100 | 0 | 0 |
| Old Colony Aviation* | Mass. | 2 | 200 | 30,000 | 6,000.00 | 2 | 75 | 0 | 0 |
| Piedmont Aviation, Inc. | N. C. | 4 | 12 | 1,560 | 280.00 | 1.5 | 65 | 0 | 0 |
| Piedmont Aviation, Inc. | Va. | 3 | 158 | 57,852 | 9,876.40 | 2.3 | 92 | 0 | 0 |
| Purdue Aero Corp. | Ind. | .... | ..... | ..... | 25,852.52 | .... | .... | .... | ..... |
| Skyhaven, Inc. | N. H. | 2 | 42 | 5,000 | 1,200.00 | 2 | 60 | 0 | 0 |
| Skymerchants | Okla. | 3 | 156 | 140,200 | 8,820.00 | 3 | 75 | 3 | 453.00 |
| Sky Taxi* | Okla. | 2 | 60 | 18,000 | 3,000.00 | 2 | 150 | 40 | 3,400.00 |
| Somerset Air Service | N. J. | 3 | 49 | 6,000 | 1,020.00 | 2 | 50 | 1 | 40.00 |
| Stuckey's Flying Service | La. | 1 | 60 | 7,200 | 2,160.00 | 1.5 | 60 | 0 | 0 |
| Volusia Aviation Service | Fla. | 2 | 20 | 2,500 | 625.00 | 2 | 62 | 0 | 0 |
| Wenatchee Air Service | Wash. | 3 | 15 | 3,000 | 360.00 | 1.5 | 100 | 12 | ..... |
| Whatcha-McCollum Flight School | Ill. | 4 | 12 | 5,000 | 750.00 | 2 | 125 | 50 | 5,000.00 |
| Wiggins Airways | Mass. | 4 | 125 | 34,174 | 2,441.50 | 2 | 75 | 0 | 0 |
| Wings, Inc. | Penna. | 4 | 175 | 20,000 | 5,000.00 | 2 | 65 | 10 | 900.00 |
| **TOTALS** | | 132 | 4,495 | 1,793,181 | $275,045.11 | .... | .... | 350 | $23,474.92 |

** Operators certificated for less than 12 months. Reports on operations are for period of certification not for entire year.*

# Air Taxi: Stepchild Gains Acceptance

THE National Air Taxi Conference, recognized by the airlines as the official body of air taxi operators, doubled its membership in 1952 and to date has certified 88 fixed-base operators as qualified air taxi services. The group, operating in 32 states and Alaska, flew an estimated 4½ million passenger-miles in 1952, for an estimated revenue of $650,000.

The Civil Aeronautics Administration reports that there are over 2,000 air taxi certificate holders in the U.S. and, from past experience, the agency figures that about 50% are actively engaged in the service. But no nationwide operational figures are available.

Under terms of the Air Taxi Agreement, the airlines and NATC are to cooperate on promotional activities and on reservations. NATC's small membership had been the cause of the airlines former reluctance to cooperate, but 1952 saw a change of heart. Of the 41 operators reporting their activities to NATC, the airlines provided 26% of the total 4,495 trips accomplished in 1952. Conversely, the NATC operators gave 814 trips to the airlines.

Although still a long way from its goal of air taxi service at every airline airport in the nation, NATC made long strides in 1952. Its members maintained about 300 aircraft for air taxi service, completing an estimated 9,000 round trips. Average passenger load is two persons.

Cargo handling represents a small but growing segment of air taxi operations. About seven per cent of the total flying was done on about 600 freight trips, which brought an additional $40,000 in revenues.

The economic impact of air taxi operations on the individual fixed-base operator varies tremendously.

Somerset Air Service, run by NATC president Sam Freeman, reports that its 1952 revenue of $1,020 for 6,000 revenue passenger-miles accounted for only three per cent of the company's total income. Cape Cod Flying Service, manager John C. Van Arsdale, reports that air taxi operations represent about two-thirds of its annual income. Cape Cod reported the second largest operation, having flown about 350,000 passenger-miles for a gross revenue of $47,724.

The factors affecting the air taxi operations are type of region, airline service, weather, and local costs.

In order to standardize costs to passengers, which vary from as low as 10c per mile for the Cessna 140 in certain areas to as high as 60c per mile for the Lockheed 10A and conflict with flat rates charged by some operators, it was proposed at the NATC annual meeting last winter to submit standard zone rate charges for CAB approval.

The initial proposal pertains to four-place aircraft and will be enlarged if successful. Based on six concentric zones of 25 miles each from the base of operation, the proposed rates are as follows: Zone 1: $15; Zone 2: $20; Zone 3: $30; Zone 4: $40; Zone 5: $50; and Zone 6: $60.

Another proposal under way in the National Aviation Trades Association, parent of NATC, is an amendment to the transportation tax act which would eliminate the 15% tax on air taxi operations carrying less than 10 passengers, since surface taxis are exempt in this way. Charles A. Parker, executive secretary of NATA, has asked the House Ways and Means Committee for a hearing.

NATC projects for 1952 and 1953 include:

• **Air travel cards** now being honored by NATC members.

• **Trip insurance** available to airline passengers using air taxis to supplement trips on scheduled airlines is under advisement by two insurance companies. This would supplement the minimum $40,000 liability insurance per passenger maintained by the operators.

• **Plans for an air taxi-airline clearing house** were mapped out for the Chicago area and a committee was appointed to work out details.

• **NATC biggest project for 1953** is a concentrated membership drive in order to strengthen its position with the airlines.

• **Negotiations are under way** with Avis Rent-A-Car and Hertz Drive-Ur-Self toward working out arrangements for air taxi terminal representation at these services' offices.

In order to insure "high standards of facilities and operations" the by-laws were rewritten, tightening up membership requirements. Major change was that new applicants must have at least two aircraft available as air taxis, one of which must be at least four place.

NATC president Sam Freeman would like to see an economical twin-engine aircraft equipped for all-weather flying which would enable air taxis to fly pretty much when the airlines do, thus increasing the service's efficiency.

• • •

## Milestones

First passenger flight achieved when Wilbur Wright piloted his aircraft carrying Charles Furnas, an employee, preparatory to delivering the plane to the government.

May 14, 1908

• • •

Longest over-water flight to date was made by J. A. D. McCurdy, flying from Key West, Fla., to a point 10 miles from Havana.

Jan. 30, 1911


Continental AIR LINES

Now authorized—starting soon

service between

TULSA... KANSAS CITY

Offering for the first time

ONE-CARRIER SERVICE BETWEEN

KANSAS CITY AND MIDLAND, EL PASO

VIA TULSA, OKLA. CITY

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CONTINENTAL AIR LINES



PRODUCING for today... BUILDING for tomorrow

This headline tells the story! Hiller Helicopters is presently giving its full energies to Armed Forces production . . . to keep our Military Services properly equipped.

However, we are also building and working toward a better tomorrow. Our engineers are already at work on plans for new Rotary Wing advances which will set the pace for tomorrow's commercial helicopter development.

Look to Hiller—one of the oldest, and best known names in Rotary Wing production – to continue a position of leadership in the helicopter field!

HILLER HELICOPTERS

1350 WILLOW ROAD • PALO ALTO, CALIF.

# Classes of Airports by States

## (CAA Figures as of December 31)

| State | Sub I & I | | II | | III | | IV | | V | | VI & Over | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1952 | 1951 | 1952 | 1951 | 1952 | 1951 | 1952 | 1951 | 1952 | 1951 | 1952 | 1951 | 1952 | 1951 |
| Alabama | 36 | 40 | 15 | 17 | 14 | 14 | 10 | 10 | 1 | 1 | 2 | 2 | 78 | 84 |
| Arizona | 75 | 71 | 43 | 43 | 30 | 31 | 12 | 14 | 14 | 13 | 5 | 3 | 179 | 175 |
| Arkansas | 51 | 55 | 10 | 11 | 10 | 10 | 9 | 9 | | 0 | | 0 | 80 | 85 |
| California | 273 | 285 | 78 | 77 | 46 | 53 | 38 | 38 | 32 | 33 | 28 | 24 | 495 | 510 |
| Colorado | 51 | 51 | 26 | 25 | 22 | 22 | 2 | 1 | | 0 | 6 | 6 | 107 | 105 |
| Connecticut | 13 | 16 | 1 | 1 | 2 | 2 | 5 | 5 | 1 | 1 | | 0 | 22 | 25 |
| Delaware | 12 | 12 | 2 | 3 | 2 | 1 | 1 | 1 | | 0 | 2 | 2 | 19 | 19 |
| District of Columbia | | 0 | | 0 | | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 3 |
| Florida | 45 | 43 | 21 | 24 | 39 | 38 | 40 | 41 | 11 | 11 | 19 | 19 | 175 | 176 |
| Georgia | 40 | 44 | 16 | 18 | 21 | 21 | 22 | 23 | 2 | 2 | 7 | 6 | 108 | 114 |
| Idaho | 122 | 123 | 14 | 16 | 7 | 7 | 2 | 2 | | 0 | 3 | 3 | 148 | 151 |
| Illinois | 101 | 100 | 43 | 43 | 12 | 13 | 8 | 9 | 3 | 4 | 2 | 0 | 169 | 169 |
| Indiana | 80 | 84 | 25 | 28 | 9 | 10 | 8 | 8 | 2 | 2 | | 0 | 124 | 132 |
| Iowa | 127 | 137 | 14 | 15 | 6 | 5 | 8 | 8 | | 0 | 1 | 1 | 156 | 166 |
| Kansas | 121 | 122 | 28 | 26 | 13 | 14 | 4 | 5 | 9 | 9 | 9 | 8 | 184 | 184 |
| Kentucky | 31 | 38 | 5 | 3 | 6 | 5 | 4 | 4 | | 0 | 1 | 1 | 47 | 51 |
| Louisiana | 54 | 47 | 15 | 14 | 12 | 12 | 7 | 8 | 3 | 2 | 3 | 3 | 94 | 86 |
| Maine | 42 | 39 | 5 | 6 | 13 | 12 | 2 | 2 | 2 | 2 | 3 | 3 | 67 | 64 |
| Maryland | 25 | 23 | 10 | 12 | 4 | 4 | 6 | 6 | | 0 | 4 | 4 | 49 | 49 |
| Massachusetts | 41 | 44 | 12 | 11 | 8 | 9 | 6 | 7 | | 0 | 4 | 3 | 71 | 74 |
| Michigan | 173 | 177 | 41 | 42 | 15 | 13 | 11 | 13 | 2 | 1 | 5 | 3 | 247 | 249 |
| Minnesota | 72 | 72 | 32 | 34 | 6 | 5 | 4 | 4 | 1 | 1 | 1 | 1 | 116 | 117 |
| Mississippi | 48 | 48 | 11 | 12 | 16 | 16 | 8 | 8 | 1 | 1 | 1 | 1 | 85 | 86 |
| Missouri | 76 | 69 | 15 | 17 | 10 | 10 | 5 | 5 | 2 | 3 | 1 | 0 | 109 | 104 |
| Montana | 89 | 85 | 15 | 15 | 7 | 6 | 6 | 6 | 2 | 2 | 4 | 4 | 123 | 118 |
| Nebraska | 96 | 102 | 13 | 12 | 4 | 5 | 2 | 2 | 2 | 2 | 11 | 11 | 128 | 134 |
| Nevada | 33 | 38 | 7 | 4 | 10 | 10 | 10 | 9 | 9 | 9 | 1 | 1 | 70 | 71 |
| New Hampshire | 20 | 24 | 5 | 4 | 3 | 3 | 2 | 2 | | 0 | 1 | 1 | 31 | 34 |
| New Jersey | 50 | 52 | 12 | 12 | 7 | 7 | 5 | 5 | 1 | 1 | 1 | 1 | 76 | 78 |
| New Mexico | 51 | 45 | 16 | 18 | 7 | 7 | 9 | 10 | 8 | 7 | 7 | 7 | 98 | 94 |
| New York | 147 | 179 | 32 | 29 | 12 | 12 | 14 | 16 | 6 | 5 | 3 | 2 | 214 | 243 |
| North Carolina | 79 | 82 | 19 | 19 | 15 | 18 | 12 | 11 | 2 | 2 | 5 | 4 | 132 | 136 |
| North Dakota | 101 | 107 | 11 | 13 | 2 | 2 | 8 | 8 | | 0 | | 0 | 122 | 130 |
| Ohio | 154 | 170 | 40 | 39 | 10 | 9 | 6 | 9 | 2 | 2 | 5 | 3 | 217 | 232 |
| Oklahoma | 88 | 90 | 21 | 21 | 13 | 13 | 12 | 13 | 7 | 7 | 4 | 3 | 145 | 147 |
| Oregon | 81 | 84 | 10 | 9 | 12 | 11 | 14 | 13 | 4 | 4 | 2 | 2 | 123 | 123 |
| Pennsylvania | 147 | 158 | 29 | 28 | 14 | 14 | 7 | 7 | 1 | 1 | 1 | 0 | 199 | 208 |
| Rhode Island | 5 | 5 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | | 0 | 11 | 10 |
| South Carolina | 28 | 28 | 13 | 13 | 2 | 3 | 13 | 11 | 5 | 6 | 3 | 3 | 64 | 64 |
| South Dakota | 47 | 50 | 8 | 10 | 6 | 6 | 4 | 3 | 2 | 2 | 2 | 2 | 69 | 73 |
| Tennessee | 35 | 39 | 12 | 13 | 3 | 3 | 4 | 5 | 4 | 3 | | 0 | 58 | 63 |
| Texas | 350 | 372 | 127 | 126 | 55 | 53 | 43 | 46 | 24 | 26 | 18 | 14 | 617 | 637 |
| Utah | 25 | 23 | 13 | 14 | 13 | 13 | 2 | 3 | 6 | 5 | 1 | 1 | 60 | 59 |
| Vermont | 18 | 17 | | 0 | 3 | 3 | | 1 | | 0 | 1 | 0 | 22 | 21 |
| Virginia | 73 | 88 | 17 | 19 | 8 | 9 | 11 | 11 | 2 | 2 | | 2 | 111 | 131 |
| Washington | 106 | 111 | 22 | 25 | 11 | 11 | 16 | 17 | 3 | 3 | 9 | 9 | 167 | 176 |
| West Virginia | 26 | 41 | 8 | 8 | 3 | 2 | 3 | 3 | 1 | 1 | | 0 | 41 | 55 |
| Wisconsin | 107 | 118 | 34 | 33 | 14 | 13 | 3 | 3 | | 0 | 2 | 2 | 160 | 169 |
| Wyoming | 20 | 23 | 9 | 10 | 13 | 12 | 6 | 6 | 1 | 1 | 1 | 1 | 50 | 53 |
| **TOTALS** | 3658 | 3871 | 976 | 993 | 571 | 573 | 437 | 453 | 181 | 180 | 190 | 167 | 6040 | 6237 |

## MILESTONES

First night flight in America made by Capt. Charles W. Hamilton at Camp Dickinson, Knoxville, Tenn.

June, 1910

First airways illumination activated as 42 landing fields on the Chicago-Iowa City-Omaha-North Platte and Cheyenne route were lit by 36-inch electric arc revolving beacons.

August 21, 1923

Atlantic City, N. J., dedicates its new Municipal Airport, the first municipal airport in the U. S.

May 3, 191

# Grant Agreements Issued During Calendar Year 1952*

FEDERAL airport grants to states experienced their smallest year in 1952. CAA's statistics show a drop of $11,433,849, or a decrease of 36.6% in grant agreements from the previous year, during which $31,286,182 was spent.

Large terminal-type airports were again the biggest recipients. Grants totaling $16,341,824, 82.3% of the total, were shared by 186 Class IV or larger airports, compared to 157 airports of the same class (down 29 airports) sharing $25,293,154 in 1951 (81%).

Class I and Class II fields felt another decrease from CAA's appropriation cut. Thirty-two states shared $1,036,510, 5.2% of total funds, to improve 71 airports, as compared with $2,052,253, 6.5% of total funds, divided among 42 states in 1951.

Class III airports continued the downward trend, with a decrease of five airports. Of the total grant, 12.4% went to 38 states (same number as 1951) giving them $2,473,999 to spread sparingly for construction or improvement of 79 airports.

Class IV airports are the minimum CAA standard facility necessary for scheduled airline operations and for

| State | 1 | | 2 | | 3 | | 4 | | 5 | | 6 & Over | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. | Federal funds | No. | Federal funds | No. | Federal funds | No. | Federal funds | No. | Federal funds | No. | Federal funds | No. | Federal funds |
| Alabama | .. | .... | .. | .... | 2 | $74,040 | 1 | $52,000 | 1 | $255,000 | 3 | $108,000 | 7 | $489,040 |
| Arizona | .. | .... | .. | .... | 1 | 12,234 | 4 | 39,888 | 1 | 18,999 | 4 | 466,604 | 10 | 537,725 |
| Arkansas | .. | .... | 1 | $50,000 | 2 | 68,092 | 2 | 24,061 | 4 | 62,168 | .. | .... | 9 | 204,321 |
| California | 1 | $767 | .. | .... | 9 | 157,468 | 4 | 68,557 | 4 | 188,634 | 5 | 586,556 | 23 | 1,001,982 |
| Colorado | .. | .... | 2 | 31,119 | .. | .... | 3 | 48,530 | .. | .... | 3 | 329,788 | 8 | 409,437 |
| Connecticut | .. | .... | .. | .... | 1 | 12,500 | 1 | 90,000 | .. | .... | .. | .... | 2 | 102,500 |
| Delaware | .. | .... | .. | .... | 1 | 20,000 | .. | .... | .. | .... | .. | .... | 1 | 20,000 |
| Dist. of Col. | .. | .... | .. | .... | .. | .... | .. | .... | .. | .... | .. | .... | 0 | 0 |
| Florida | .. | .... | .. | .... | 1 | 76,000 | 1 | 25,988 | 2 | 56,000 | 4 | 921,527 | 8 | 1,079,515 |
| Georgia | .. | .... | .. | .... | 1 | 40,000 | 3 | 23,211 | 3 | 27,920 | 1 | 126,000 | 8 | 217,131 |
| Idaho | 2 | 21,448 | 3 | 24,108 | .. | .... | 4 | 111,642 | .. | .... | 2 | 16,156 | 11 | 173,354 |
| Illinois | .. | .... | .. | .... | 2 | 69,000 | 2 | 475,000 | .. | .... | 1 | 410,000 | 5 | 954,000 |
| Indiana | .. | .... | .. | .... | 1 | 8,000 | 1 | 70,000 | 3 | 207,000 | .. | .... | 5 | 285,000 |
| Iowa | 1 | 2,600 | 1 | 4,700 | 1 | 82,950 | 3 | 74,625 | 3 | 195,600 | .. | .... | 9 | 360,475 |
| Kansas | 1 | 15,000 | .. | .... | 2 | 80,123 | 1 | 72,000 | 4 | 134,695 | 2 | 38,600 | 10 | 340,418 |
| Kentucky | .. | .... | 1 | 100,000 | 4 | 217,500 | .. | .... | 1 | 45,000 | .. | .... | 6 | 362,500 |
| Louisiana | .. | .... | 1 | 7,950 | 3 | 41,642 | 1 | 5,305 | 3 | 249,473 | .. | .... | 8 | 304,370 |
| Maine | .. | .... | 2 | 10,000 | 3 | 53,088 | 1 | 50,000 | .. | .... | .. | .... | 6 | 113,088 |
| Maryland | .. | .... | .. | .... | 1 | 60,000 | .. | .... | .. | .... | 1 | 68,176 | 2 | 128,176 |
| Massachusetts | .. | .... | 1 | 55,000 | 4 | 76,108 | 3 | 484,443 | .. | .... | .. | .... | 8 | 615,551 |
| Michigan | .. | .... | .. | .... | 1 | 3,000 | 2 | 80,000 | .. | .... | 2 | 371,500 | 5 | 454,500 |
| Minnesota | 1 | 5,766 | 4 | 142,050 | 6 | 179,000 | 1 | 6,000 | 1 | 283,500 | .. | .... | 13 | 616,316 |
| Mississippi | 1 | 3,452 | 2 | 49,332 | 4 | 161,520 | .. | .... | .. | .... | .. | .... | 7 | 214,304 |
| Missouri | .. | .... | 1 | 8,000 | 1 | 9,000 | .. | .... | .. | .... | 3 | 400,037 | 5 | 417,037 |
| Montana | 6 | 32,611 | 2 | 1,551 | 1 | 991 | 3 | 25,444 | 3 | 19,642 | 2 | 76,418 | 17 | 156,657 |
| Nebraska | 3 | 28,800 | 2 | 57,000 | 2 | 17,000 | .. | .... | .. | .... | 2 | 89,315 | 9 | 192,115 |
| Nevada | 2 | 31,710 | 2 | 41,056 | 1 | 23,750 | .. | .... | 2 | 74,187 | .. | .... | 7 | 170,703 |
| New Hampshire | .. | .... | .. | .... | .. | .... | .. | .... | .. | .... | .. | .... | 0 | 0 |
| New Jersey | .. | .... | .. | .... | 1 | 8,000 | .. | .... | .. | .... | .. | .... | 1 | 8,000 |
| New Mexico | .. | .... | 1 | 46,950 | 2 | 63,926 | 3 | 124,477 | .. | .... | .. | .... | 6 | 235,353 |
| New York | .. | .... | .. | .... | .. | .... | 2 | 625,000 | 1 | 165,000 | 2 | 676,370 | 5 | 1,466,370 |
| North Carolina | .. | .... | .. | .... | 2 | 118,944 | 1 | 1,600 | 4 | 727,000 | .. | .... | 7 | 847,544 |
| North Dakota | .. | .... | .. | .... | 2 | 11,500 | 4 | 53,300 | 2 | 103,300 | .. | .... | 8 | 168,100 |
| Ohio | .. | .... | .. | .... | .. | .... | 2 | 69,300 | .. | .... | 3 | 255,741 | 5 | 325,041 |
| Oklahoma | .. | .... | 1 | 6,156 | .. | .... | 3 | 304,763 | .. | .... | .. | .... | 4 | 310,919 |
| Oregon | .. | .... | .. | .... | 2 | 9,304 | 4 | 147,765 | 4 | 222,059 | 1 | 284,710 | 11 | 663,838 |
| Pennsylvania | .. | .... | .. | .... | 1 | 150,000 | 3 | 525,850 | 2 | 900,000 | .. | .... | 6 | 1,575,850 |
| Rhode Island | .. | .... | .. | .... | .. | .... | 1 | 50,000 | .. | .... | .. | .... | 1 | 50,000 |
| South Carolina | .. | .... | .. | .... | 1 | 20,000 | 2 | 212,425 | 2 | 25,488 | .. | .... | 5 | 257,913 |
| South Dakota | 13 | 72,395 | 4 | 8,352 | 2 | 3,869 | 3 | 40,842 | 1 | 963 | .. | .... | 23 | 126,421 |
| Tennessee | 4 | 102,500 | 1 | 37,500 | .. | .... | 1 | 71,000 | 1 | 83,998 | .. | .... | 7 | 294,998 |
| Texas | .. | .... | .. | .... | 2 | 27,249 | 1 | 214,987 | 2 | 117,162 | 5 | 939,168 | 10 | 1,298,566 |
| Utah | 1 | 9,166 | .. | .... | .. | .... | .. | .... | .. | .... | 1 | 342,491 | 2 | 351,657 |
| Vermont | .. | .... | .. | .... | 1 | 32,000 | .. | .... | .. | .... | .. | .... | 1 | 32,000 |
| Virginia | .. | .... | .. | .... | 1 | 121,500 | 1 | 38,000 | .. | .... | .. | .... | 2 | 159,500 |
| Washington | .. | .... | .. | .... | 1 | 13,210 | 1 | 13,978 | .. | .... | 5 | 298,108 | 7 | 325,287 |
| West Virginia | .. | .... | .. | .... | 3 | 212,500 | 3 | 377,000 | .. | .... | .. | .... | 6 | 589,500 |
| Wisconsin | .. | .... | 1 | 13,000 | 3 | 139,000 | .. | .... | 1 | 30,000 | 1 | 534,000 | 6 | 716,000 |
| Wyoming | .. | .... | 2 | 16,471 | .. | .... | 2 | 112,790 | .. | .... | .. | .... | 4 | 129,261 |
| U. S. TOTAL | 36 | 326,215 | 35 | 710,295 | 79 | 2,473,999 | 78 | 4,809,771 | 55 | 4,192,788 | 53 | 7,339,265 | 336 | 19,852,333 |
| Alaska | .. | .... | 5 | 77,363* | 3 | 346,795 | .. | .... | .. | .... | .. | .... | 8 | 424,158 |
| Hawaii | .. | .... | .. | .... | 1 | 11,200 | 1 | 150,000 | 3 | 348,550 | 1 | 164,200 | 6 | 673,950 |
| Puerto Rico | .. | .... | .. | .... | .. | .... | .. | .... | .. | .... | 2 | 790,966 | 2 | 790,966 |
| Virgin Islands | .. | .... | .. | .... | 1 | 12,750 | .. | .... | .. | .... | .. | .... | 1 | 12,750 |
| TERR. TOTAL | .. | .... | 5 | 77,363 | 5 | 370,745 | 1 | 150,000 | 3 | 348,550 | 3 | 955,166 | 17 | 1,901,824 |
| GRAND TOTAL | 36 | 326,215 | 40 | 787,658 | 84 | 2,844,744 | 79 | 4,959,771 | 58 | 4,541,338 | 56 | 8,294,431 | 353 | 21,754,157 |

* *Seaplane Bases*

other large aircraft operators. This type of airport participated in 24.2%, or $4,809,771 of the total aid offered last year. Thirty-six states shared this amount, with 78 airports benefiting. New York was the largest benefactor, receiving $625,000, 13% of the Federal appropriation.

Class V and Class VI and larger terminal-type airports were allocated the largest slice of Federal aid for their part in the national transport plan and the defense emergency.

Last year $11,532,053, 58% of the total funds, was shared by 108 airports in 34 states, 32.1% of total of airports receiving aid. Of this total aid, 55 Class V airports received $4,192,788, 21.1%, for major construction or improvement in 24 states, and 53 Class VI & larger terminals received $7,339,265, 37%, of the total Federal aid in 21 states.

The major share of Federal grants went to five states, with each state receiving over a million dollars. They include:

• **Pennsylvania** received the largest allocation of $1,575,850, 7.9%, affecting work on two Class V airports, three Class IV airports, and one Class III field;

• **New York** received $1,466,370 or 7.3% for two Class VI or larger terminals, one Class V airport, and two Class IV airports;

• **Texas** was granted $1,298,566 or 6.5% for five Class VI and larger terminal-type airports, two Class V airports, one Class IV and two Class III fields;

• **Florida** received $1,079,515, 5.4% of total Federal aid going to four Class VI and larger terminals, two Class V airports, one Class IV, and one Class III fields;

• **California** received $1,001,982, 5% of total aid going to five Class VI and larger airports, four Class V airports, four Class IV, nine Class III, and one Class I field.

The smallest grant offered went to New Jersey with $8,000 going to one Class III field; New Hampshire received no Federal funds in 1952.

Total number of airports granted aid last year increased by only two, from 334 in 1951 to 336 airports in 1952.

## Milestones

**First commercial aviation on a regular schedule is started when Henry Ford starts his air freight line between Detroit and Chicago.**

**April 13, 1925**

**First land plane commercial flight from North America to Europe is completed when American Airlines DC-4 lands at Hurn Airfield, England, from New York City, after a 14 hour and five minute flight.**

**October 24, 1945**

## Aircraft Operations at 25 Leading Airports*

(1952 compared with 1951)

| 1952 Ranking | | Air Carrier Operations | % of Total Operations | 1951 Ranking | Air Carrier Operations | % of Total Operations |
|---|---|---|---|---|---|---|
| 1. | Chicago (Midway) | 233,630 | 79.1 | 1 | 200,182 | 75.8 |
| 2. | La Guardia | 164,816 | 84.7 | 2 | 161,823 | 78.7 |
| 3. | Washington | 151,880 | 78.1 | 3 | 143,021 | 73.6 |
| 4. | Los Angeles | 122,186 | 55.9 | 4 | 110,193 | 57.4 |
| 5. | San Francisco | 107,993 | 68.8 | 6 | 101,613 | 69.3 |
| 6. | Miami | 106,602 | 39.1 | 5 | 102,207 | 44.3 |
| 7. | Detroit (Willow Run) | 100,142 | 79.5 | 7 | 94,510 | 80.1 |
| 8. | Dallas | 98,802 | 49.2 | 8 | 93 881 | 50.6 |
| 9. | Idlewild | 96,357 | 84.2 | 47 | 26,739 | 52.1 |
| 10. | Cleveland | 95,397 | 33.9 | 9 | 88,708 | 26.1 |
| 11. | Pittsburgh | 92,508 | 43.0 | 11 | 84,063 | 41.7 |
| 12. | Atlanta | 87,511 | 42.5 | 13 | 79,019 | 37.6 |
| 13. | Kansas City | 85,221 | 53.5 | 15 | 73,329 | 48.8 |
| 14. | Oakland | 79,395 | 42.4 | 17 | 62,148 | 32.5 |
| 15. | Boston | 78,318 | 64.5 | 12 | 80,618 | 67.9 |
| 16. | St. Louis | 76,367 | 42.3 | 16 | 66,325 | 34.3 |
| 17. | Philadelphia | 75,385 | 51.5 | 14 | 77,815 | 52.2 |
| 18. | Jacksonville | 60,691 | 47.5 | 18 | 59,891 | 46.2 |
| 19. | Indianapolis | 59,116 | 46.0 | 19 | 57,152 | 41.6 |
| 20. | Burbank | 58,136 | 42.5 | 24 | 45,802 | 32.2 |
| 21. | Louisville | 57,278 | 76.7 | 21 | 53,859 | 72.1 |
| 22. | Cincinnati (Covington) | 54,874 | 75.3 | 20 | 53,962 | 71.4 |
| 23. | Denver | 52,221 | 20.3 | 22 | 50,607 | 22.4 |
| 24. | Minneapolis | 49,427 | 18.1 | 28 | 40,640 | 17.6 |
| 25. | Houston | 48,873 | 41.6 | 21 | 46,811 | 38.9 |
| | **TOTALS** | 2,293,126 | 50.2 | | 2,054,918 | 46.5 |
| | **Totals for all CAA towers** | 4,866,358 | 30.7 | | 4 555,509 | 28.5 |

* *Landings and takeoffs.*

# Chicago Keeps Lead as Busiest Airport

With airlines striving for larger and higher density aircraft every year, the air carrier movements at airport terminals continue to rise above previous years' figures. Last year air carrier operations at all CAA traffic-controlled airports went up 6.4%, totaling 15,814,213, as compared with 4,555,509 operations in 1951.

The air carrier activities at twenty-five leading terminal-type airports accounted for 50.2% of the 4,565,262 landing and take-off operations, an increase of 11.1% over the 2,054,918 movements in 1951. In that year air carrier operations represented 46.5% of total operations.

• **Chicago** again retained a firm hold on the number one spot, this being its fifth consecutive year in this position, with a total of 233,630 air carrier movements, these represented 79.1% of all operations, as against 200,182 movements, or 75.8% of total traffic in 1951.

• **New York's La Guardia** had a total of 164,816 air carrier landing and take-off operations, representing 84.7% of all operations. This brought it to the second highest position among the nation's airports. In 1951 La Guardia's air carrier movements accounted for 78.7% of all operations.

• **Washington National Airport** continued to hold third place by a safe margin, with 151,880 air carrier movements, as compared with fourth place Los Angeles with 122,186 movements.

Among the airports showing a decrease in air carrier movements in 1952 were Philadelphia and Boston.

One new airport made the list with a big jump from 47th place to ninth. The newcomer to the group was New York's International (Idlewild) Airport, which handled the biggest percentage of the operations formerly handled by Newark.

Newark, ranking 10th in 1951, dropped far below the top 25 due to the airport being closed to traffic because of a series of accidents early in 1952.

Minneapolis re-entered the top 25 after dropping to 28th place in 1951.

Air carrier movements at the 175 CAA-control-tower-operated fields totaled 4,866,358 last year as against 4,555,509 in 1951, an increase of 6.4%. The ratio of air carrier activity to total aircraft movements at the 25 airports was 50.2% of last year. Air carrier movements in 1952 represented 30.7% of all aircraft movements, compared with 28.5% the year before at all airports.

A downward trend continues among the local civil aircraft users. Last year locally based civil aircraft accounted for 4,565,689 landing and take-off operations at all airports, as compared with 6,175,588 in 1951, a 26.1% drop in activity.

## CAB News

### As Of Now . . .

The schedule of hearings involving service to Alaska, Hawaii, and the Trans-Pacific area generally has been set back several weeks. The **Trans-Pacific Renewal Case** will now start on June 22, the **West Coast-Hawaii Case** on July 6, and the **States-Alaska Case** on July 27. Involved is the question of renewal of temporary certificates and applications for new routes.

Also stalled, pending CAB action on dismissal motions, is the Board's **General Passenger Fare Investigation.** Originally scheduled for hearings May 1, the case has been indefinitely delayed. All domestic trunk airline parties want CAB to drop the investigation which, if continued, might lead to a general fare reduction. Board is studying the motions and is expected to rule momentarily.

Up for consideration again, now that CAB has a full membership of five men, is the **Wiggins Renewal Investigation.** Last fall CAB denied Wiggins application for renewal of its certificate by a 3-2 vote. The deciding voter was then-chairman Donald W. Nyrop. When Wiggins applied for reconsideration, Nyrop had resigned, and the Board was split 2-2 on the matter. It deferred ruling pending nomination of a fifth member. Now it will hear Wiggins argue its case again before ruling.

### CAB Decisions

- **Trans World Airlines'** certificate for Route 2 reissued to eliminate Marion, Mansfield and Zanesville, Ohio, as scheduled stops, effective April 15.
- **Sea Airmotive, Inc.** application for exemption to conduct air transportation of persons and property within a radius of 200 miles of Anchorage deferred pending full hearings.
- **Ozark Airlines** local service route No. 107 extended from St. Louis to Milwaukee via Springfield, Peoria, Davenport-Moline and Rockford.

### CAB Calendar

**April 28**—Oral argument before the Board in Portland-Seattle Service Case (Northwest Airlines). Washington, D. C. (Docket 2901 et al.).

**April 30**—Oral argument before the Board in Wichita Falls-Dallas Service Case. Washington, D. C. (Docket 3094 et al.).

**May 5**—Oral argument before the Board in Pan American World Airways Ferry Flight Investigation. Washington, D. C. (Docket 5477).

**May 6**—Hearing in Tariff Liability Rules Investigation. Washington, D. C. (Docket 4059).

**May 12**—Oral argument before the Board in Reopened Wiggins Renewal Investigation Case. Washington, D. C. (Docket 5055 et al.).

## Milestone

Donald W. Douglas organizes the Douglas Aircraft Company, the company which by early 1952 had produced 56% of the transport aircraft in use by the world's airlines.

July, 1921

## Airport Precision Approach and Surveillance Radar

| City and Airport | Precision Approach Radar | Airport Surveillance Radar |
|---|---|---|
| Baltimore, Md. (Friendship Intl.) | ..... | E-9-53[3] |
| Boston, Mass. (Logan Intl.) | 11-15-50[1] | 9-28-50[1] |
| Buffalo, N. Y. (Municipal) | ..... | E-3-55[3] |
| Newark, N. J. (Municipal) | 11-15-52[MPN-1] | 6-28-52[MPN-1] |
| | E-2-54[3] | E-7-53[3] |
| New York, N. Y. (LaGuardia) | 5-31-50[1] | 5-31-50[1] |
| New York, N. Y. (International) | 2-15-51[1] | 2-15-51[1] |
| Norfolk, Va. (Municipal) | ..... | E-5-53[3] |
| Philadelphia, Pa. (Intl.) | E-10-53[3] | E-7-53[3] |
| Pittsburgh, Pa. (Gr. Pitts.) | E-3-54[3] | E-8-53[3] |
| Washington, D. C. (National) | 1-10-51[1] | 1-10-51[1] |
| Atlanta, Ga. (Municipal) | 10-15-50[1] | 10-15-50[1] |
| Chicago, Ill. (Midway) | 5-15-50[1] | 9-21-50[1] |
| Cleveland, Ohio (Hopkins) | 9-5-50[1] | 9-5-50[1] |
| Cincinnati, O. (Gr. Cinn.) | ..... | E-9-54[1] |
| Columbus, O. (Port Columbus) | ..... | E-10-53[2] |
| Detroit, Mich. (Willow Run) | E-4-54[3] | E-6-53[3] |
| Indianapolis, Ind. (Municipal) | E-11-54[3] | E-6-53[3] |
| Louisville, Ky. (Standiford) | ..... | E-2-54[3] |
| Milwaukee, Wis. (Truax) | ..... | E-10-53[3] |
| Minneapolis, Minn. (St. Paul Intl.) | 7-16-51[MPN-A] | E-11-53[3] |
| | | 7-16-51[MPN-1] |
| Corpus Christi, Tex. (Cliff Maus) | ..... | E-5-54[3] |
| Dallas, Tex. (Love) | E-1-53[3] | E-8-53[3] |
| Fort Worth, Tex. (Intl.) | ..... | E-1-54[3] |
| Houston, Tex. (Municipal) | E-2-55[3] | E-5-53[3] |
| New Orleans, La. (Moisant Intl.) | ..... | E-7-53[3] |
| Oklahoma City, Okla. (Will Rogers) | ..... | E-9-54[3] |
| Shreveport, La. (Municipal) | ..... | E-4-54[3] |
| Denver, Colo. (Stapleton) | ..... | E-8-54[2] |
| Kansas City, Mo. (Municipal) | E-10-54[2] | E-8-53[3] |
| St. Louis, Mo. (Lambert) | E-12-54[1] | E-10-53[3] |
| Burbank, Calif. (Lockheed AT) | ..... | E-6-54[3] |
| Los Angeles, Calif. (International) | 6-16-50[1] | 6-15-50[1] |
| Oakland, Calif. (Municipal) | E-5-54[3] | E-6-53[3] |
| Salt Lake City, Utah (Municipal No. 1) | ..... | E-9-53[3] |
| San Francisco, Calif. (Municipal) | E-6-54[3] | E-7-53[3] |
| Portland, Ore. (Intl.) | E-7-54[1] | E-4-53[3] |
| Seattle, Wash. (Seattle-Tacoma) | E-8-54[3] | E-8-53[3] |

*E—Estimated*
*—1—Gilfillan Brothers* *—3—Bendix Aviation*
*—2—General Electric* *MPN-1—War surplus*

*SOURCE: Civil Aeronautics Administration*

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# Traffic Control & Landing Aids

Dates of Installation

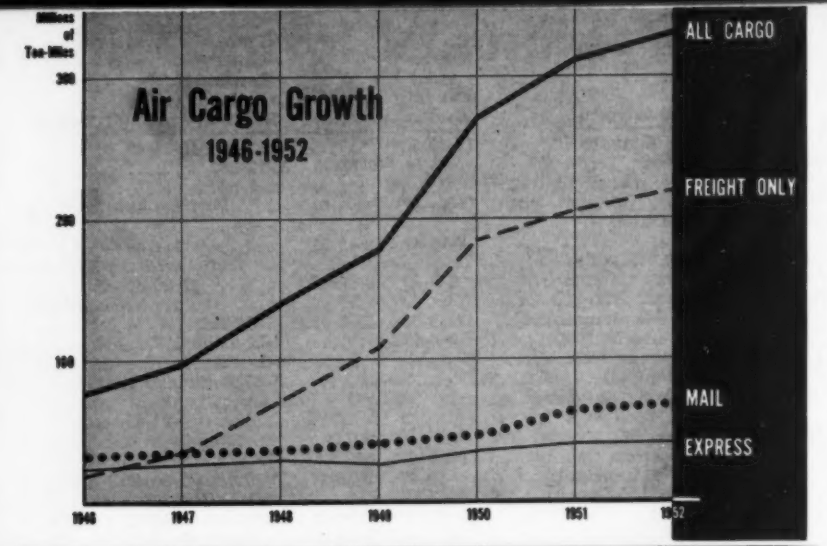
| City and Airport | Instrument Landing System | Approach Lights | Combined Tower Station DTVAC | Tower AC | Tower |
|---|---|---|---|---|---|
| **REGION ONE** | | | | | |
| Albany, N. Y. (Municipal) | E-7-53 | 8-11-52 | E-7-54 | 5-12-43 | |
| Allentown, Pa. (Bethlehem-Easton) | E-2-54 | | E-7-54 | 10-20-50 | |
| Atlantic City, N. J. (NAS) | E-10-54 | | | | |
| Baltimore, Md. (Friendship Intl.) | 9-13-50 | *4-5-51 | 2-4-53 | | |
| Baltimore, Md. (Harbor) | | | | | 6-1-42 |
| Bedford, Mass. (Hanscom) | 8-13-48 | 4-15-48 | | 10-3-47 | |
| Binghampton, N. Y. (Broome Co.) | OWGS | | 8-15-51 | | |
| Boston, Mass. (Logan International) | 11-15-50 | 5-27-47 *DOCAI | | 1-1-42 | |
| Bridgeport, Conn. (Municipal | | | | | 2-11-43 |
| Buffalo, N. Y. (Municipal) | 5-28-47 | 12-30-40 | | 1-7-42 | |
| Burlington, Vt. (Municipal) | E-5-53 | | 12-17-52 | | |
| Charleston, W. Va. (Kanawha Co.) | OWGS | 5-3-49 | | 7-17-50 | |
| Elmira, N. Y. (Chemung County) | | | | 9-21-48 | |
| Erie, Pa. (Port Erie) | 6-20-47 | 11-15-46 | | | |
| Harrisburg, Pa. (State) | E-12-53 | | 4-9-53 | | |
| Hartford, Conn. (Brainard) | | | | 3-1-42 | |
| Islip, N. Y. (MacArthur) | 5-11-48 | 7-2-47 | | | |
| Lynchburg, Va. (Preston Glenn) | | | | 11-12-46 No AC | |
| Newark, N. J. (Municipal) | 11-26-52 | 11-14-52 | | 1-1-42 | |
| New Bedford, Mass. (Municipal) | 8-30-49 | 3-2-49 | | | E-9-53 |
| New York, N. Y. (La Guardia) | 6-21-46 | 7-25-52 | | 10-1-46 | |
| New York, N. Y. (International) | 6-4-49 | *11-9-49 | | 6-1-48 | |
| Niagara Falls, N. Y. (Municipal) | 5-18-49 | | | | 11-13-47 |
| Norfolk, Va. (Municipal) | 5-21-48 | 1-2-48 | 3-5-52 | | |
| Philadelphia, Pa. (Intl.) | 6-11-47 | *11-16-51 | | 4-1-47 | |
| Pittsburgh, Pa. (Allegheny Co.) | 11-20-49 | 1-15-38 1-18-49 | | 11-1-42 | |
| Pittsburgh, Pa. (Greater Pitts.) | 5-7-52 | 4-11-49 | | 5-28-52 | |
| Portland, Me. (Municipal) | | 8-8-52 No AC | | | |
| Providence, R. I. (T. F. Greene) | E-8-53 | | E-4-54 | 2-1-42 | |
| Reading, Pa. (Gen. Carl A. Spaatz) | 6-30-47 | 10-2-46 | | 10-15-47 | |
| Richmond, Va. (Byrd) | 9-9-48 | 12-13-47 | E-10-54 | 1-7-43 | |
| Roanoke, Va. (Municipal) | | | 8-11-52 | | |
| Rochester, N. Y. (Municipal) | 2-20-53 | | E-5-53 | 12-1-48 | |
| Syracuse, N. Y. (Hancock) | 9-20-49 | 10-4-49 | E-12-53 | 9-1-46 | |
| Teterboro, N. J. (Teterboro) | 6-15-49 | 5-20-48 | | | 8-25-47 |
| Washington, D. C. (National) | 10-23-45 | *5-30-50 | | 6-15-41 | |
| Westfield, Mass. (Barnes) | | | | | 12-11-47 |
| Wheeling, W. Va. (Ohio County) | E-8-53 | | | | E-7-53 |
| White Plains, N. Y. (Westchester Co.) | 4-9-48 | 11-19-47 | | 1-1-47 | |
| Wilkes-Barre, Pa. (Scranton) | 6-8-51 | | | | E-11-53 |
| Wilmington, Del. (New Castle Co.) | 6-28-51 | 2-7-49 | | 10-30-47 | |
| Windsor Locks, Conn. (Bradley) | 9-18-47 | 9-8-47 | | 9-15-48 | |
| Worcester, Mass. (Municipal) | 1-10-49 | 3-10-48 | | | |
| **REGION TWO** | | | | | |
| Ashville, N. C. (Hendersonville) | | | | | 8-15-50 |
| Atlanta, Ga. (Municipal) | 11-24-49 | *1-20-51 | | 11-1-41 | |
| Augusta, Ga. (Bush) | OWGS | | 7-1-50 | | |
| Birmingham, Ala. (Municipal) | 2-16-48 | *4-30-51 | E-5-54 | 1-1-42 | |
| Bristol, Tenn. (Tri-City) | 12-17-49 | 1-14-49 | E-9-53 | 10-5-46 | |
| Charleston, S. C. (Municipal) | 12-18-46 | 9-18-46 | 11-12-52 | | |
| Charlotte, N. C. (Douglas) | 8-10-49 | 7-16-48 | | 11-15-41 | |
| Chattanooga, Tenn. (Lovell) | 9-19-52 | E-4-53 | 1-9-52 | | |
| Columbus, S. C. (Municipal) | OWGS | | 6-13-51 | | |
| Columbus, Ga. (Muscogee Co.) | DOCAI | | | | |
| Daytona Beach, Fla. (Municipal) | | | 12-8-52 | | |
| Greensboro, N. C. (High Point) | 1-23-53 | 7-24-52 | | 7-28-43 | |
| Greenville, S. C. (Municipal) | OWGS | | | 7-15-48 | |
| Jackson, Miss. (Hawkins) | 3-20-47 | 1-10-47 | 12-6-51 | | |
| Jacksonville, Fla. (Imeson) | 3-13-47 | 1-1-47 | | 1-1-42 | |
| Knoxville, Tenn. (McGee Tyson) | 11-22-46 | *E-6-53 10-23-46 | E-9-53 | 5-21-42 | |
| Macon, Ga. (Cochran) | 8-5-52 | | | | |
| Memphis, Tenn. (Municipal) | 11-26-46 | 11-23-46 | | 1-1-42 | |
| Meridian, Miss. (Key) | DOCAI | DOCAI | | | |
| Miami, Fla. (International) | 1-18-52 | 12-29-51 | | 8-3-42 | |
| Mobile, Ala. (Bates) | OWGS | | | 2-18-47 | |
| Montgomery, Ala. (Dannelly) | E-5-54 | | | 4-14-48 | |
| Nashville, Tenn. (Barry) | 10-15-48 | | | | |
| Orlando, Fla. (Municipal #1) | OWGS | | | | |
| Pensacola, Fla. (Haglar) | E-7-53 | | | | |
| Raleigh, N. C. (Raleigh-Durham) | 11-22-46 | | | | |
| San Juan, P. R. (Isla Grande) | | | | | |
| Savannah, Ga. (Travis) | E-9-53 | | | | |
| Spartansburg, S. C. (Municipal) | | | | | |
| Tallahassee, Fla. (Dale Mabry) | 9-3-47 | | | | |
| Tampa, Fla. (International) | 2-3-48 | | | | |
| W. Palm Beach, Fla. (Intl) | | | | | |
| Wilmington, N. C. (New Hanover Co.) | E-7-53 | | | | |
| Winston-Salem, N. C. (Smith Reynolds) | OWGS | | | | |
| **REGION THREE** | | | | | |
| Akron, O. (Municipal) | | | | | |
| Akron, O. (Akron Canton) | 7-1-48 | | | | |
| Battle Creek, Mich. (Kellogg) | | | | | |
| Bismark, N. D. (Municipal) | 12-9-47 | | | | |
| Chicago, Ill. (Midway) | 4-30-47 | | | | |
| Chicago, Ill. (O'Hare) | | | | | |
| Cincinnati, O. (Gr. Cincinnati) | 1-10-47 | | | | |
| Cincinnati, O. (Lunken) | | | | | |
| Cleveland, O. (Hopkins) | 3-28-48 | | | | |
| Columbus, O. (Port Columbus) | E-4-53 | | | | |
| Dayton, O. (Municipal) | 7-31-46 | | | | |
| Detroit, Mich. (Willow Run) | 7-31-47 | | | | |
| Detroit, Mich. (Wayne Major) | E-7-53 | | | | |
| Detroit, Mich. (Detroit City) | | | | | |
| Duluth, Minn. (Municipal) | | | | | |
| E. St. Louis, Ill. (Parks) | | | | | |
| Evansville, Ind. (Dress Memorial) | E-7-53 | | | | |
| Fargo, N. D. (Municipal) | 4-1-49 | | | | |
| Flint, Mich (Bishop) | E-4-53 | | | | |
| Fort Wayne, Ind. (Baer) | 3-12-49 | | | | |
| Grand Rapids, Mich. (Kent County) | E-11-53 | | | | |
| Indianapolis, Ind. (Municipal) | 6-15-46 | | | | |
| Lansing, Mich. (Capital City) | E-7-53 | | | | |
| Lexington, Ky. (Blue Grass) | E-3-54 | | | | |
| Louisville, Ky. (Standiford) | 11-15-47 | | | | |
| Louisville, Ky. (Bowman) | | | | | |
| Madison, Wis. (Truax) | E-4-53 | | | | |
| Milwaukee, Wis. (Gen. Mitchell) | 2-25-49 | | | | |
| Minneapolis, Minn. (St. Paul Intl.) | 3-6-51 | | | | |
| Moline, Ill. (Quad City) | 4-4-50 | | | | |
| Muskegon, Mich. (County) | E-12-53 | | | | |
| Peoria, Ill. (Greater Peoria) | | | | | |
| Rochester, Minn. (Municipal) | | | | | |
| St. Paul, Minn. (Holman) | | | | | |
| Sault Ste. Marie, Mich. (Kinross) | 4-25-50 | | | | |
| South Bend, Ind. (St. Joseph Co.) | 5-3-48 | | | | |
| Springfield, Ill. (Capital) | | | | | |
| Toledo, O. (Municipal) | | | | | |
| Youngstown, O. (Municipal) | E-7-53 | | | | |
| **REGION FOUR** | | | | | |
| Abilene, Tex. (Municipal) | E-9-53 | | | | |
| Albuquerque, N. M. (Kirkland AFB) | 1-11-47 | | | | |
| Amarillo, Tex. (Air Terminal) | 4-25-51 | | | | |
| Austin, Tex. (Robert Mueller) | 7-26-47 | | | | |
| Baton Rouge, La. (Harding) | 12-12-52 | | | | |
| Beaumont, Tex. (Jefferson Co.) | E-6-53 | | | | |
| Brownsville, Tex. (International) | 11-30-49 | | | | |
| Corpus Christi, Tex. (Cliff Maus) | E-9-53 | | | | |
| Dallas, Tex. (Love) | 2-3-47 | | | | |
| El Paso, Tex. (International) | 3-4-47 | | | | |
| Fort Smith, Ark (Municipal) | 12-13-52 | | | | |
| Fort Worth, Tex. (International) | E-5-53 | | | | |
| Fort Worth, Tex. (Meacham) | 12-23-48 | | | | |
| Houston, Tex. (Municipal) | 6-13-47 | | | | |
| Lake Charles, La. (AFB) | E-6-53 | | | | |
| Little Rock, Ark. (Adams) | E-6-53 | | | | |

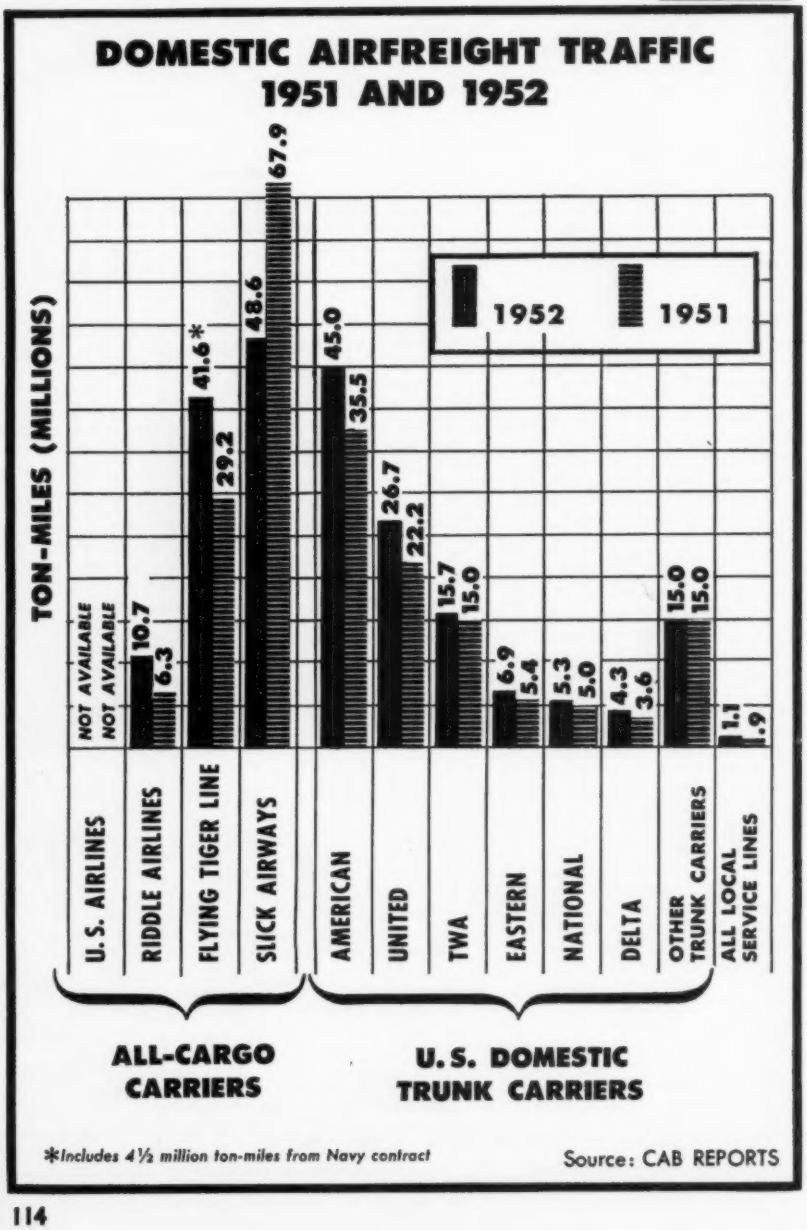
| City and Airport | Instrument Landing System | Approach Lights | Combined Tower Station DTVAC | Tower AC | Tower |
|---|---|---|---|---|---|
| Lubbock, Tex. (Municipal) | 11-19-52 | ..... | E-7-53 | 10-15-49 | ..... |
| Midland, Tex. (Air Terminal) | 1-7-49 | 9-17-48 | 2-12-53† | ..... | ..... |
| New Orleans, La. (Municipal) | ..... | ..... | 12-1-52 | ..... | ..... |
| New Orleans, La. (Moisant Intl.) | 5-15-47 | *4-4-51 | ..... | 5-1-46 | ..... |
| Oklahoma City, Okla. (Will Rogers) | 6-19-47 | *12-15-52 | ..... | 2-1-46 | ..... |
| San Angelo, Tex. (Mathis) | ..... | ..... | ..... | ..... | E-10-53 |
| San Antonio, Tex. (Municipal) | 1-7-47 | 9-12-46 | ..... | 11-20-42 | ..... |
| San Antonio, Tex. (Stinson) | ..... | ..... | ..... | ..... | 9-1-49 |
| Shreveport, La. (Municipal) | 11-19-52 | 11-7-52 | 7-6-52 | ..... | ..... |
| Tulsa, Okla. (Municipal) | E-6-53 | ..... | 4-22-52 | ..... | ..... |
| Tyler, Tex. (Municipal) | E-10-53 | ..... | 10-12-52† | ..... | ..... |
| Waco, Tex. (Municipal) | ..... | ..... | 5-28-51 | ..... | ..... |
| Wichita Falls, Tex. (Sheppard AFB) | ..... | ..... | ..... | 4-22-48 | ..... |
| **REGION FIVE** | | | | | |
| Casper, Wyo. (Natrona County) | 1-23-53 | ..... | ..... | ..... | ..... |
| Cheyenne, Wyo. (Municipal) | 7-26-47 | 3-18-47 | ..... | 7-30-42 | ..... |
| Colorado Springs (Peterson) | 3-23-51 | ..... | 8-1-48 | ..... | ..... |
| Denver, Colo. (Stapleton) | 7-11-46 | *E-6-53 | ..... | 2-1-42 | ..... |
| Des Moines (Municipal) | 11-5-47 | 8-19-47 | ..... | 9-13-43 | ..... |
| Grand Junction, Colo. (Walker) | 2-20-46 | 6-8-46 | ..... | ..... | ..... |
| Huron, S. D. (Municipal) | OWGS | ..... | ..... | ..... | ..... |
| Joplin, Mo. (Municipal) | E-4-53 | ..... | ..... | ..... | ..... |
| Kansas City, Kans. (Fairfax) | ..... | ..... | ..... | ..... | 3-16-42 |
| Kansas City, Mo. (Municipal) | 7-8-52 | *4-15-52<br>1-22-48 | ..... | 1-1-42 | ..... |
| Lincoln, Neb. (Municipal) | 12-11-52 | ..... | 3-6-51 | ..... | ..... |
| Omaha, Neb. (Municipal) | 9-24-50 | 12-31-49 | ..... | 7-23-42 | ..... |
| Pueblo, Colo. (Municipal) | ..... | ..... | E-9-54 | 3-15-50 | ..... |
| Quincy, Ill. (Baldwin-Quincy) | 12-31-52 | ..... | ..... | ..... | ..... |
| Rock Spring, Wyo. (Municipal) | 11-10-47 | 9-2-47 | ..... | ..... | ..... |
| St. Joseph, Mo. (Rosecrans) | 1-15-48 | 12-23-47 | 8-17-52† | ..... | ..... |
| St. Louis, Mo. (Lambert) | 6-25-47 | *3-29-51 | ..... | 1-1-42 | ..... |
| Sioux City, Iowa (Municipal) | 2-17-53 | ..... | ..... | 3-5-45 | ..... |
| Sioux Falls, S. D. (Municipal) | E-9-53 | ..... | E-4-53 CTS | ..... | ..... |
| Springfield, Mo. (Municipal) | E-9-53 | ..... | E-8-53 | ..... | ..... |
| Topeka, Kans. (Philip Billard) | 12-1-48 | 11-4-50 | 4-10-51 | ..... | ..... |
| Wichita, Kans. (Municipal) | 4-11-47 | 2-5-46 | ..... | 1-1-42 | ..... |
| **REGION SIX** | | | | | |
| Arcata, Calif. (Municipal) | 4-21-51 | *7-1-50 | ..... | ..... | ..... |
| Bakersfield, Calif. (Kern County) | 4-18-47 | ..... | ..... | ..... | 5-27-42 |
| Burbank, Calif. (Lockheed AT) | 12-23-52 | *8-22-52 | E-12-53 | 2-16-43 | ..... |
| Fresno, Calif. (Air Terminal) | 6-14-49 | 7-13-48 | E-3-53 | ..... | 2-20-48 |
| Las Vegas, Nev. (McCarran) | ..... | ..... | 6-8-51 | ..... | ..... |
| Long Beach, Calif. (Municipal) | 3-11-48 | 10-1-47 | ..... | 1-16-42 | ..... |
| Los Angeles, Calif. (Intl.) | 6-25-47 | *1-18-50 | ..... | 1-22-42 | ..... |
| Oakland, Calif. (Municipal) | 3-6-47 | *3-8-51 | ..... | 3-10-42 | ..... |
| Ontario, Calif. (Intl.) | 3-13-52 | 9-28-50 | ..... | ..... | ..... |
| Phoenix, Arizona (Sky Harbor) | ..... | ..... | 12-20-52† | ..... | ..... |
| Reno, Nev. (United Air Lines) | ..... | ..... | 8-2-51 | ..... | ..... |
| Sacramento, Calif. (Municipal) | 8-18-51 | ..... | 12-8-52 | ..... | ..... |
| Salt Lake City, U. (Mun'c'p'l #1) | 12-6-46 | 10-16-46 | ..... | 11-6-41 | ..... |
| San Diego, Calif. (Lindbergh) | ..... | ..... | ..... | 4-1-42 | ..... |
| San Francisco, Calif. (Municipal) | 2-27-48 | *E-3-53 | ..... | 6-1-42 | ..... |
| Santa Barbara, Calif. (Municipal) | OWGS | ..... | ..... | 11-1-42 | ..... |
| Santa Monica, Calif. (Municipal) | ..... | ..... | ..... | ..... | 10-1-48 |
| Stockton, Calif. (Stockton) | ..... | ..... | ..... | ..... | Indef. |
| Tucson, Arizona (Municipal) | ..... | ..... | ..... | 5-1-42 | ..... |
| Van Nuys, Calif. (San Fernando V.) | ..... | ..... | ..... | ..... | 4-1-51 |
| Winslow, Arizona (Municipal) | ..... | 9-1-47 | ..... | ..... | ..... |
| **REGION SEVEN** | | | | | |
| Bellingham, Wash. (Municipal) | E-4-53 | ..... | ..... | ..... | ..... |
| Billings, Mont. (Municipal) | 10-22-46 | 10-21-46 | ..... | 9-29-42 | ..... |
| Boise, Idaho (Air Terminal) | 1-23-48 | 1-23-48 | 11-24-52 | ..... | ..... |
| Eugene, Ore. (Mahlon Sweet) | 12-20-46 | 12-20-46 | ..... | ..... | ..... |
| Great Falls, Mont. (Municipal) | 9-26-52 | ..... | ..... | 7-22-42 | ..... |
| Helena, Mont. (Montana) | ..... | ..... | 7-16-51† | ..... | ..... |
| Medford, Ore. (Municipal) | E-9-53 | ..... | E-8-53 | 10-24-42 | ..... |
| Pendleton, Ore. (Municipal) | E-3-53 | ..... | E-5-54 | 2-23-42 | ..... |
| Pocatello, Idaho (Phillips) | E-4-53 | ..... | 4-11-52† | ..... | ..... |
| Portland, Ore. (Intl) | 10-13-51 | *5-6-52 | ..... | 11-24-41 | ..... |
| Salem, Ore. (McNary) | 7-29-52 | ..... | ..... | ..... | 4-14-49 |
| Seattle, Wash. (Seattle-Tacoma) | 3-16-47 | *11-16-51 | ..... | 7-7-49 | ..... |
| Seattle, Wash. (Boeing) | ..... | ..... | ..... | ..... | 1-1-42 |
| Spokane, Wash. (Geiger) | 2-23-48 | 2-23-48 | ..... | 1-1-42 | ..... |
| Yakima, Wash. (Municipal) | E-9-53 | ..... | 10-17-52† | ..... | ..... |

*DOCAI—Dependent on completion of airport Construction.*
**—Hi-intensity approach lights.*
*Source: Civil Aeronautics Administration*

*E—Estimated*
*OWGS—Operating without Glide Slope*
*† No approach control*

| Approach Lights | Combined Tower Station DTVAC | Tower AC | Tower |
|---|---|---|---|
| *4-18-51 | E-9-53 | 1-1-42 | ..... |
| ..... | ..... | 11-27-41 | ..... |
| ..... | ..... | 5-7-49 | ..... |
| 10-25-46 | ..... | 1-20-47 | ..... |
| ..... | ..... | 11-1-47 | ..... |
| ..... | E-3-53 | 10-1-50 | ..... |
| ..... | 3-17-52 | ..... | ..... |
| 9-3-47 | E-11-53 | 3-18-42 | ..... |
| 10-23-47 | 1-19-53 | ..... | ..... |
| ..... | E-8-53 | 4-25-42 | ..... |
| ..... | 9-12-51 | ..... | ..... |
| ..... | ..... | 11-16-42 | ..... |
| ..... | E-6-53 | ..... | 11-25-42 |
| 7-2-48 | ..... | 12-30-48 | ..... |
| ..... | ..... | 3-21-49 | ..... |
| 12-22-47 | E-3-53 | ..... | ..... |
| | No AC | | |
| *3-4-50 | ..... | ..... | ..... |
| 8-7-42 | | | |
| ..... | ..... | 10-23-46 | ..... |
| 1-10-47 | ..... | 1-10-47 | ..... |
| ..... | ..... | 10-16-42 | ..... |
| *9-25-50 | ..... | 2-1-43 | ..... |
| E-4-53 | ..... | 2-12-42 | ..... |
| 11-28-46 | ..... | 3-26-43 | ..... |
| *1-19-51 | ..... | 1-31-47 | ..... |
| ..... | ..... | ..... | 8-30-47 |
| ..... | ..... | 8-1-46 | ..... |
| ..... | 4-16-51 | ..... | ..... |
| | No AC | | |
| ..... | ..... | ..... | Indef. |
| ..... | E-5-54 | 11-4-42 | ..... |
| 12-29-47 | E-12-54 | 8-6-46 | ..... |
| ..... | ..... | 10-1-46 | ..... |
| 10-29-52 | E-3-53 | 4-21-47 | ..... |
| ..... | ..... | 9-15-47 | ..... |
| *5-2-51 | ..... | 1-18-43 | ..... |
| 12-4-46 | | | |
| ..... | ..... | 4-30-49 | ..... |
| ..... | ..... | 1-15-50 | ..... |
| *4-27-51 | ..... | 11-15-47 | ..... |
| ..... | ..... | ..... | 10-1-48 |
| ..... | ..... | 5-1-49 | ..... |
| 2-25-49 | ..... | 6-3-42 | ..... |
| *3-6-51 | ..... | 5-16-42 | ..... |
| 4-29-48 | | | |
| 4-11-50 | ..... | ..... | E-6-54 |
| ..... | ..... | 6-16-49 | ..... |
| ..... | 12-15-50 | ..... | ..... |
| ..... | E-6-54 | 10-1-46 | ..... |
| ..... | ..... | ..... | E-6-54 |
| ..... | ..... | ..... | ..... |
| 6-21-48 | ..... | 9-16-43 | ..... |
| ..... | E-4-53 | ..... | ..... |
| | No AC | | |
| ..... | ..... | 5-1-47 | ..... |
| ..... | ..... | 5-1-47 | ..... |
| ..... | 8-7-51 | ..... | ..... |
| 9-14-43 | ..... | 11-18-41 | ..... |
| 4-25-51 | ..... | 10-2-42 | ..... |
| 7-26-47 | ..... | 7-5-43 | ..... |
| ..... | E-5-53 | ..... | ..... |
| | No AC | | |
| ..... | ..... | ..... | ..... |
| 9-12-46 | 12-15-50 | ..... | ..... |
| ..... | E-7-53 | 10-1-42 | ..... |
| 12-11-52 | ..... | 5-16-42 | ..... |
| 10-1-46 | ..... | 10-1-42 | ..... |
| ..... | ..... | ..... | ..... |
| *E-3-53 | ..... | ..... | E-3-53 |
| 12-11-43 | ..... | 6-11-42 | ..... |
| *1-1-51 | ..... | 6-12-42 | ..... |
| ..... | ..... | ..... | ..... |
| ..... | 10-15-51 | ..... | ..... |




## 220½ Million Ton-Miles Cargo Carried in '52

THE SCHEDULED air carriers of the United States flew 220,593,058 ton-miles of domestic air freight during 1952, for a gain of 6½% over the preceding year.

Carriers hauling both passengers and air freight carried slightly more freight than the all-cargo carriers (exclusive of military contract operations): 54%; in 1951, the haul was just about split down the middle with the all-cargo lines flying 50.2%.

Slick Airways again led as the biggest single carrier of domestic air freight, although it dropped better than 19 million ton-miles to 48½ million. Again, the figures cited exclude military contract operations.

Military contract operations did account for a sizeable bit of traffic in 1952. The Navy's all-cargo transcontinental route contract, which was taken over by The Flying Tiger Line in October, 1952, reportedly amounts to 1.5 million ton-miles of traffic per month, and L. R. Hackney, speaking as executive vice president of Transport Air Group, says that the four scheduled all-cargo lines hauled 122,798,000 ton-miles of domestic air freight in 1952.

Some of that was hauled by U.S. Airlines under its all-cargo certificate, but U.S., plagued with reorganizations last year, has had trouble getting records up to date, and at press time did not have traffic statistics available. Full scale operations after the latest reorganization did not get under way until November, under Fred Miller, former head of Air America, a large irregular carrier.

The difference between Hackney's figure and that reported by the three scheduled cargo carriers to CAB represents at least part of the domestic military contracts. There may be more, because in some instances the military does not want such figures released.

Riddle Airlines, with 1952 its first full calendar year of operation, rang up better than 10 million ton-miles, to move into sixth place among the haulers of domestic air freight.

Air cargo, which includes air freight, air express, and air mail, also climbed 6½% over 1951, to 331,188,297 ton-miles, with air mail up 8% and express up less than 2/10 of 1%. Gains in air cargo for the past two years have not been as sharp as they were from 1946 through 1950.

In 1949, the year all-cargo carriers were certificated, air cargo gained 27%, while air freight gained 51%. In 1950, the first full year of operations for all-cargo carriers, air freight jumped 72%,

carrying the cargo total up 52%. The all-cargo carriers do not carry air mail or air express, but have applications to do so pending before the Board.

One other factor influencing 1950's big jump was a modification of the Civil Aeronautics Board minimum rate order which permitted carriers to publish rates below the 16c per ton-mile floor for west to east and south to north shipments. With the reduced rates, carriers were able to overcome to some extent the unbalance in traffic flow from the highly industrialized northeast section of the United States.

The influence of all-cargo ships on the growth of air freight has been pointed out by survey after survey, and in 1952 nearly 90%, or all but 22,955,222 ton-miles, of the traffic was carried by lines having all-cargo ships. That does not mean that American Airlines, standing next to Slick, hauled 45 million ton-miles of air freight on all-cargo ships, but it did have cargo ships as a sales feature, and shippers recognize that on aircraft which carry both passengers and cargo, passengers move first.

Another noteworthy item was the fact that 181 million ton-miles of domestic air freight moved on carriers operating between the east and west coasts. In addition to the mileage involved, because air freight is still essentially a long-haul proposition, was the one-carrier aspect. The top five lines, offering one-carrier service between most of the traffic centers, accounted for better than three-fourths of the total domestic air freight haul.

The importance of one carrier service was also shown by the Origin and Destination Survey for 1950, issued by The Port of New York Authority in December, 1952.

Using 1950 as the base year (to eliminate the effect of the Korean conflict), the Authority made a random sampling of domestic airwaybills. All told, 24,572 abstracts of waybills for shipments originating or terminating at New York City's airports were obtained. One of its findings: of 23,647 shipments, consisting of 183,683 pieces and 5,739,010 pounds, seven of the shipments moved via a three-carrier routing, and 968 shipments, less than 5%, moved via a two-carrier routing. • • •

### Milestone

**Carrying a cargo of baked beans from Boston to Providence, Harry M. Jones demonstrated air parcel post service flying a Wright B.**

**January 13, 1913**

## USAF To Double Private Maintenance

Maj. Gen. Clarence S. Irvine, the Air Materiel Command's Deputy Commanding General for Production, says the USAF is planning to expand the granting of maintenance and overhaul contracts to private firms. He predicted a doubling of civilian overhaul and maintenance work on Air Force planes in the next two fiscal years.

Irvine said the Air Force, which now stands at about 100 wings, has about 21% of its maintenance handled by private companies. By fiscal 1955, he added, when the USAF will have reached its 143-wing goal, maintenance contracts will probably jump to 43%.

The AMC official gave two basic reasons for using contract maintenance. First, he said, it gets the work done without requiring the Air Force to spend money on additional facilities. It will also help stabilize the aircraft industry.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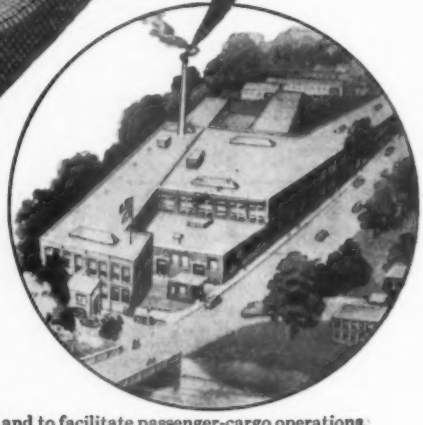

The Slumberyde* was designed for Pan American World Airways' new DC-6B Clippers. It provides the ideal seating combination for relaxing day and night air travel. Cushioned with thick foam rubber, it provides body-fitting comfort in any position. Requires less space than conventional berths for overnight flights.

Flexibility is an important feature of the Slumberyde. It is adaptable to a wide variety of seating arrangements, can be faced forward or aft, on either side of the ship. This seat is particularly adaptable to a unique type of installation that permits attaching, detaching, or spacing the seats with ease to meet pay-load requirements. The back folds forward to simplify handling and to facilitate passenger-cargo operations.

AEROTHERM seats are designed so that small detail parts, rather than whole major assemblies, can be replaced at scheduled stops quickly, easily, and inexpensively. The Slumberyde is contoured to fit the Douglas DC-4 and DC-6, Boeing Stratocruiser, and Lockheed Constellation.

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*Reg. T.M. Applied for.

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## 1952 Airline Salaries

*Following are 1952 airline salaries as reported to CAB:*

### Capital Airlines, Inc.

**J. H. Carmichael,** pres. and dir., $48,000 salary (up $4,000); **R. G. Lochiel,** v.p., treas. and dir., $30,000 salary (up $1,400); **James W. Austin,** v.p., $28,000 salary (up $1,600); **James B. Franklin,** v.p., $26,000 salary (up $1,250); **Robert J. Wilson,** v.p. and dir., $22,250 salary (up $470); **Hayes Dever,** secy., $17,500 salary (up $450); **Charles H. Murchison,** chairman, exec. committee, $18,000 salary (up $1,500).

### Chicago & Southern Air Lines, Inc.

**Carleton Putnam,** chairman of board and dir., $16,000 salary (down $3,667.67), $300 bonus and indirect compensation; **Sidney A. Stewart,** pres. and dir., $36,333.36 salary (up $2,000.03), $250 bonus and indir.; **Junius H. Cooper,** v.p. finance and dir., $19,666.64 salary (up $999.97), $250 bonus and indir.; **William T. Arthur,** v.p. oper., $19.166.64 salary (up $999.98); **Richard S. Maurer,** v.p., secy. and general counsel, $15,666.72 salary (up $1,000.05); **Thomas M. Miller,** v.p. traffic & sales, $14,666.64 salary (up $999.98); **William T. Beebe,** v. p. personnel, $14.666.64 salary (up $999.98); **Thomas F. Hambleton,** treas., $8,666.72 salary (up $541.72); **Robert S. Scrivener,** asst. treas., $5,160 salary; **Erma Murray,** asst. secy., $4,680 salary.

### Trans World Airlines, Inc.

**R. S. Damon,** pres. and dir., $84,999.96 salary, $1,100 dir. fee, $26,306.98 bonus and indirect compensation; **Warren Lee Pierson,** chairman of board, $69,924.92 salary (up $4,925), $800 dir. fee, $25,119.32 bonus and indir.; **J. A. Collings,** exec. v.p. and dir., $48,000 salary (up $2,375), $1,000 dir. fee, $19,302.53 bonus and indir.; **E. O. Cocke,** v.p. sales and dir., $30,000 salary (up $1,979.23), $900 dir. fee, $12,223.94 bonus and indir.; **T. K. Taylor,** v.p., $19,187.42 salary (up $4.250), $3,861.84 bonus and indir.; **G. L. Gilmore,** v.p., $16,458.20 salary (up $1,874.95), $3,568.02 bonus and indir.; **D. W. Harris,** v.p., $17,958.20 salary (up $2,187.40), $3,600.93 bonus and indir.; **G. H. Clay,** secy., $19,458.20 salary (up $1,645.86), $5,983.30 bonus and indir.; **M. J. Plodinec,** comptroller, $17,491.63 salary (up $1,929.13), $3,679.78 bonus and indir.; **J. L. Weller,** v.p. (elected v.p. July 1, 1952), $15,374.92 salary, $2,829.58 bonus and indir.; **E. M. Constable,** treas. $18,958.28 salary (up $4.020.86), $4,389.10 bonus and indir.

*NOTE: Indirect compensation includes (a) amounts applicable to corporation's retirement plan for calendar 1952, although payments made under said plan are not actually allocated for benefit of any person prior to his retirement; (b) difference between purchase price and market price of stock issued during year under employees stock purchase plan; (c) corporation premiums on aviation accident and group insurance plans.*

## Milestone

First regularly scheduled airline started operations across Tampa Bay between St. Petersburg and Tampa, Fla. Tony Jannus was pilot and plane was a Benoist flying boat. Operation survived three months.

January 1, 1914

## Productivity of Airline Employees

| Carrier | 1951 No. of Empl. | 1951 Total Ton-Miles Rev. Traffic | 1951 Ton-Miles Per Empl. | 1952 No. of Empl. | 1952 Total Ton-Miles Rev. Traffic | 1952 Ton-Miles Per Empl. |
|---|---|---|---|---|---|---|
| Allegheny | 458 | 3,210,906 | 7,010 | 474 | 2,782,460 | 5,870 |
| Bonanza | 147 | 734,316 | 4,995 | 186 | 1,081,017 | 5,811 |
| Central | 262 | 534,480 | 2,040 | 261 | 706,215 | 2,705 |
| Empire* | 118 | 926,836 | 7,854 | ... | ..... | .... |
| Frontier | 533 | 3,321,453 | 6,231 | 545 | 3,958,896 | 7,242 |
| Lake Central | 183 | 668,315 | 3,652 | 161 | 575,721 | 3,575 |
| Mohawk | 243 | 1,590,989 | 6,547 | 250 | 1,875,060 | 7,500 |
| North Central | 289 | 1,610,680 | 5,573 | 488 | 2,625,174 | 5,379 |
| Ozark | 325 | 833,417 | 2,564 | 379 | 1,434,151 | 3,784 |
| Piedmont | 468 | 4,521,974 | 9,662 | 601 | 5,157,648 | 8,581 |
| Pioneer | 449 | 4,722,037 | 10,517 | 449 | 5,128,361 | 11,399 |
| Southern | 428 | 1,831,966 | 4,280 | 463 | 2,169,819 | 4,686 |
| Southwest | 306 | 2,981,883 | 9,744 | 355 | 3,304,513 | 9,308 |
| Trans-Texas | 374 | 1,996,911 | 5,339 | 368 | 1,970,247 | 5,353 |
| West Coast† | 159 | 1,134,464 | 7,135 | 359 | 2,316,103 | 6,451 |
| Wiggins | 35 | 37,152 | 1,061 | 35 | 31,164 | 890 |
| Totals | 4,777 | 30,666,779 | 6,419 | 5,374 | 35,116,549 | 6,534 |

** Braniff and Mid-Continent merger was effective August 16, 1952, Braniff being the surviving company.*
*† West Coast and Empire merger was effective August 4, 1952, West Coast being the surviving company.*
*Source: American Aviation Survey.*

| Carrier | 1946 No. of Empl. | 1946 Total Ton-Miles Rev. Traffic | 1946 Ton-Miles Per Empl. | 1951 No. of Empl. | 1951 Total Ton-Miles Rev. Traffic | 1951 Ton-Miles Per Empl. | 1952 No. of Empl. | 1952 Total Ton-Miles Rev. Traffic | 1952 Ton-Miles Per Empl. |
|---|---|---|---|---|---|---|---|---|---|
| American | 14,148 | 151,884,767 | 10,735 | 14,017 | 297,482,320 | 21,223 | 14,921 | 346,209,859 | 23,201 |
| Braniff* | 2,441 | 23,027,582 | 9,434 | 2,410 | 30,483,333 | 12,648 | 3,539 | 47,237,646 | 13,347 |
| Capital | 4,774 | 36,472,866 | 7,639 | 4,078 | 68,670,412 | 16,002 | 4,290 | 69,338,107 | 16,162 |
| C & S | 2,045 | 14,856,170 | 7,264 | 1,385 | 18,416,312 | 13,296 | 1,402 | 22,352,955 | 15,943 |
| Colonial | 564 | 4,752,253 | 8,425 | 617 | 6,495,473 | 10,527 | 669 | 7,339,675 | 10,971 |
| Continental | 700 | 7,916,367 | 11,309 | 884 | 11,851,061 | 13,406 | 906 | 14,791,437 | 16,326 |
| Delta | 2,643 | 21,903,281 | 8,287 | 2,591 | 45,616,475 | 17,625 | 2,732 | 50,142,668 | 18,353 |
| Eastern | 6,636 | 88,649,810 | 13,358 | 8,235 | 175,161,239 | 21,218 | 9,002 | 208,291,291 | 23,138 |
| Inland‡ | 185 | 2,330,378 | 12,595 | 224 | 4,346,432 | 19,403 | .... | ..... | .... |
| Mid-Cont.* | 961 | 8,134,065 | 8,464 | 1,222 | 13,071,178 | 10,696 | .... | ..... | .... |
| National | 1,905 | 18,788,378 | 9,862 | 2,444 | 48,179,174 | 19,713 | 2,784 | 53,996,970 | 10,395 |
| Northeast | 1,122 | 7,267,369 | 6,477 | 774 | 8,602,344 | 11,114 | 830 | 8,270,369 | 9,964 |
| Northwest | 4,274 | 41,181,283 | 9,635 | 4,882 | 53,580,817 | 10,975 | 5,086 | 65,269,527 | 12,833 |
| TWA | 10,061 | 85,642,067 | 8,512 | 10,543 | 180,212,309 | 18,041 | 11,378 | 213,795,834 | 18,790 |
| United | 13,363 | 122,254,911 | 9,148 | 10,937 | 219,298,730 | 20,051 | 12,899 | 275,578,905 | 21,365 |
| Western‡ | 2,342 | 20,546,237 | 8,772 | 1,194 | 23,202,548 | 19,432 | 1,621 | 31,434,343 | 19,391 |
| Totals | 68,164 | 655,607,784 | 9,618 | 66,457 | 1,204,670,647 | 18,127 | 72,059 | 1,414,049,586 | 19,623 |

** Braniff and Mid-Continent merger was effective August 16, 1952, Braniff being the surviving company.*
*‡ Western and Inland merger was effective April 9, 1952, Western being the surviving company.*
*Source: American Aviation Survey.*

# Productivity Rises Eight Per Cent

The domestic scheduled trunk airlines produced a record total of 1,414,049,586 ton-miles of revenue traffic in 1952, which they handled with an average total employment of 72,059. These figures break down to a ton-mile productivity per employe of 19,623 ton-miles, an increase in output per employe of 8.2% over the preceding year and better than double that of six years earlier in 1946.

Total production for the trunklines in 1952 was 17.3%, while employment for the year increased only 8.4% despite the rise in productivity. In 1951, the then 16 trunk lines piled up 1,204,670,647 ton-miles of revenue traffic which was handled by 66,457 employes, with 18,127 ton-miles of service performed per employe. In 1946 it was 9,618 ton-miles of service per employe.

Fifteen local service airlines, in 1952, realized 6,534 ton-miles of service per employe in chalking up a total of 35,116,549 ton-miles of revenue traffic with a total average employment of 5,374. This compares with 6,419 ton-miles of service performed per employe in 1951 when 16 carriers with 4,777 employes handled a total of 30,666,779 ton-miles of revenue traffic.

Total production was up 14.5% in 1952 but was accompanied by a corresponding gain in employment which showed a rise of 12.4%. Employe output for the local lines as a group showed a modest gain of 1.7% over 1951.

# 1952 Direct Operating Costs — U. S. Scheduled Airline Transports

(Cents Per Plane-Mile)

**Editor's Note:** Direct operating costs shown here were compiled by survey of the airlines by AMERICAN AVIATION. The figures make interesting general comparisons but *are not suitable* for comparing the operating costs of two airlines using the same equipment. Such a comparison requires detailed information on the nature of depreciation, specific routes flown, general type of operation, major equipment modifications, etc.

| | Douglas Aircraft | | | | | | | | Lockheed Aircraft | | | | Boeing | | Convair | | Martin | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | DC-3 | | DC-4 | | DC-6 | | DC-6B | | 649-749 | | 1049 | | 377 | | 240 | | 202 | 404 |
| | 1951 | 1952 | 1951 | 1952 | 1951 | 1952 | 1951 | 1952 | 1951 | 1952 | 1951 | 1952 | 1951 | 1952 | 1951 | 1952 | 1951 | 1952 |
| gheny .. | 52.32 | 56.64 | ..... | ..... | ..... | ..... | ..... | ..... | .... | ..... | ..... | .... | ..... | ..... | ..... | ..... | ..... | .... |
| erican .. | .... | .... | 92.2 | 92.1 | 88.8<br>76.4C | 94.0<br>80.0 | 80.6 | 103.4 | .... | ..... | ..... | .... | ..... | ..... | 79.7 | 81.8 | ..... | .... |
| anza ... | 48.77 | 50.57 | ..... | ..... | ..... | ..... | ..... | ..... | .... | ..... | ..... | .... | ..... | ..... | ..... | ..... | ..... | .... |
| niff ..... | .... | 42.69 | ..... | 78.65 | ..... | 94.39 | ..... | ..... | .... | ..... | ..... | .... | ..... | ..... | 74.34 | 79.18Z | ..... | .... |
| ital .... | 42.5 | 45.7 | 68.7 | 70.3 | ..... | ..... | ..... | ..... | 136.3 | 127.5 | ..... | .... | ..... | ..... | ..... | ..... | ..... | .... |
| tral .... | 50.7 | .... | ..... | ..... | ..... | ..... | ..... | ..... | .... | ..... | ..... | .... | ..... | ..... | ..... | ..... | ..... | .... |
| S ..... | 28.47 | 38.18 | 49.57 | ..... | ..... | ..... | ..... | ..... | .... | 107.46 | ..... | .... | ..... | ..... | ..... | ..... | ..... | .... |
| | | 36.30F | | | | | | | | | | | | | | | | |
| onial .... | NA | 62.12* | NA | 62.12 | ..... | ..... | ..... | ..... | .... | ..... | ..... | .... | ..... | ..... | ..... | ..... | ..... | .... |
| tinental | 34.90 | 36.81 | 173.09 | 66.54<br>191.25X | 121.60 | 120.42L | ..... | 120.42L | .... | ..... | ..... | .... | ..... | ..... | 64.16 | 66.54 | ..... | .... |
| ta ..... | 38.22 | 42.31 | 60.20 | 70.18 | 88.03 | 97.84 | ..... | ..... | .... | ..... | ..... | .... | ..... | ..... | ..... | ..... | ..... | .... |
| tern .... | 37.62D | .... | 74.38 | ..... | ..... | ..... | ..... | ..... | .... | ..... | 192.73 | .... | ..... | ..... | ..... | ..... | ..... | .... |
| | 26.51C | | 68.15 | | | | | | | | | | | | | | | |
| ntier ... | 43.05 | 47.06 | ..... | ..... | ..... | ..... | ..... | ..... | .... | ..... | ..... | .... | ..... | ..... | ..... | ..... | ..... | .... |
| allan .. | 43.46D | 42.69 | ..... | ..... | ..... | ..... | ..... | ..... | .... | ..... | ..... | .... | ..... | ..... | ..... | ..... | ..... | .... |
| | 42.19C | 44.16 | | | | | | | | | | | | | | | | |
| awk .... | 52.4 | 55.9 | ..... | ..... | ..... | ..... | ..... | ..... | .... | ..... | ..... | .... | ..... | ..... | ..... | ..... | ..... | .... |
| ional .... | .... | .... | 73.57F | 69.42 | 84.53 | 89.06 | ..... | 86.14 | .... | ..... | ..... | .... | ..... | ..... | ..... | ..... | ..... | .... |
| th Central | 48.45 | 54.32 | ..... | ..... | ..... | ..... | ..... | ..... | .... | ..... | ..... | .... | ..... | ..... | ..... | ..... | ..... | .... |
| theast .. | 45.65 | NA | ..... | ..... | ..... | ..... | ..... | ..... | .... | ..... | ..... | .... | ..... | ..... | 98.59 | ..... | ..... | .... |
| thwest .. | 67.93 | 66.02 | 81.35D<br>83.53F | 76.72 | ..... | ..... | ..... | ..... | .... | ..... | ..... | .... | 211.29F<br>171.94 | 202.96<br>168.68 | ..... | ..... | ..... | .... |
| rk ..... | 56.98 | 55.35 | ..... | ..... | ..... | ..... | ..... | ..... | .... | ..... | ..... | .... | ..... | ..... | ..... | ..... | ..... | .... |
| A* PAD . | .... | .... | 98.00 | 108.00<br>86.00AD | ..... | ..... | ..... | 170.00 | .... | ..... | ..... | .... | 191.00 | 191.00 | ..... | ..... | ..... | .... |
| NIAGRA . | .... | .... | ..... | ..... | ..... | ..... | ..... | ..... | .... | 184.00 | ..... | .... | ..... | ..... | ..... | ..... | ..... | .... |
| dmont .. | 40.75 | 44.75 | ..... | ..... | ..... | ..... | ..... | ..... | .... | ..... | ..... | .... | ..... | ..... | ..... | ..... | ..... | .... |
| neer .... | NA | 99.00 | ..... | ..... | ..... | ..... | ..... | ..... | .... | ..... | ..... | .... | ..... | ..... | ..... | ..... | 131.00 | .... |
| k ..... | .... | .... | ..... | ..... | 71.00 | 93.00C | DC-6A | ..... | .... | ..... | ..... | .... | ..... | ..... | ..... | ..... | ..... | .... |
| thern .. | 46.71 | 48.31 | ..... | ..... | ..... | ..... | ..... | ..... | .... | ..... | ..... | .... | ..... | ..... | ..... | ..... | ..... | .... |
| thwest .. | 40.07 | 44.41 | ..... | ..... | ..... | ..... | ..... | ..... | .... | ..... | ..... | .... | ..... | ..... | ..... | ..... | ..... | .... |
| ns-Pacific | 40.84 | 38.40 | ..... | ..... | ..... | ..... | ..... | ..... | .... | ..... | ..... | .... | ..... | ..... | ..... | ..... | ..... | .... |
| ns-Texas. | 38.51 | 43.53 | ..... | ..... | ..... | ..... | ..... | ..... | .... | ..... | ..... | .... | ..... | ..... | ..... | ..... | ..... | .... |
| ns World | 40.22 | .... | ..... | ..... | ..... | ..... | ..... | ..... | 101.5 | ..... | ..... | .... | ..... | ..... | ..... | ..... | ..... | .... |
| ted ..... | 39.50D | 41.98 | 63.83D | 63.30 | 81.88 | 85.52 | 89.06 | 92.23 | .... | ..... | ..... | .... | 190.39 | 179.79 | ..... | ..... | ..... | .... |
| | 42.77C | | 65.96C | | | | | | | | | | | | | | | |
| st Coast.. | 36.47 | 42.45 | ..... | ..... | ..... | ..... | ..... | ..... | .... | ..... | ..... | .... | ..... | ..... | ..... | ..... | ..... | .... |
| stern .... | NA | .... | ..... | ..... | ..... | ..... | ..... | ..... | .... | ..... | ..... | .... | ..... | ..... | ..... | ..... | ..... | .... |

*Domestic passenger C—Cargo F—International * Combined DC-3 & DC-4 L—DC-6 and 6B leased Y—Coach Z—340 AD—Alaska Div. X—Charter only*

*Source: American Aviation Survey*

# No Relief Seen for Rising Operating Costs

Airline direct operating costs continued their steady predicted rise throughout 1952, and at the year's end there was little to indicate that the leveling-off point was in sight. Increases of six to 10c per plane-mile were not unusual, and played a major role in the jump in overall operating costs of 21.6% for the domestic lines and 12.5% for the international carriers.

The outlook for 1953 is no more promising. With the removal of remaining price controls, particularly those on aviation gasoline, further increases similar in scope to those experienced in 1952 are to be expected. The cost trend for 1952 is apparent in 30 out of 40 instances shown here where airlines reported higher costs than those experienced in 1951.

Analysis of the 1950-51-52 reports points up these trends on specific types of aircraft:

• **Douglas DC-3** direct operating costs in 1952 averaged 48.15c per plane-mile for 21 airplanes, a 17.6% increase over the 40.94c average cost reported by these operators in 1950, and a 13.7% rise over the 42.35c plane-mile costs reported in 1951.

• **Douglas DC-4** fared better, with the 1950 average costs of 71.92 cents increasing only 2.6% to 73.81c in 1951, and climbing another 0.8% in 1952 for a direct operating cost of 74.38c per plane-mile.

• **DC-6 operations** also showed higher costs. In 1952 the average direct operating cost rose to 92.16c, a 14.0% increase over 1950, when the average cost was 71.92c and a 7.8% rise over the 85.81c cost reported for 1951. The newer Douglas DC-6B, which came through its first year of operation in 1951 with an average DOC of 84.83c, climbed to 93.92c per plane-mile, a jump of 10.7%.

• **Convair 240 costs** reported by two operators reflect a 2.49c increase, only a 2.9% rise over the average 69.76c costs shown by five airlines as an average for 1950.

• **The Convair 340,** introduced into service late in 1952, shows a direct operating cost of 79.18 cents per plane-mile.

Similar comparisons on Lockheed Constellation and Boeing 377 airplanes are hampered by lack of reports. However, information provided by Northeast Airlines and United show the B-377 direct operating cost on the downward trend. UAL's 1950 direct cost of $2.46 per plane-mile for the Stratocruiser, which had been pared to $1.90 in 1951, dropped further in 1952 to $1.79 cents per plane-miles, an overall 27% reduction. • • •

## Milestones

**First engine to be produced by Pratt & Whitney is completed, a nine cylinder radial engine developing about 400 horsepower at 1800 rpm.**

**February 6, 1926**

**First officially recorded rotor helicopter flight in Western Hemisphere: Vought-Sikorsky, piloted by Igor Sikorsky; flying time, 1 hour five minutes and 4.5 seconds at Stratford, Conn.**

**April 15, 1941**

# ALL THESE GREAT AIRLINES

# FLY WITH *Dependable* CHAMPION SPARK PLUGS!

The airlines are unquestionably the world's most exacting buyers of spark plugs. This is in keeping with the tremendous premium the air transport industry places on engine performance and dependability.

Over the years, Champion Spark Plugs have met the ever increasing demands of aviation progress to a degree that all major scheduled airlines in the United States, plus most overseas operators, use Champions—the majority of them exclusively.

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CHAMPION
IS A
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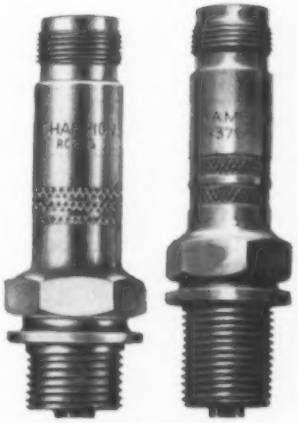


*The RC26S and R37S-1 are the most widely used of Champion's many types of aircraft spark plugs.*

AMERICAN CHEMICAL PAINT COMPANY

AMBLER CHEMICALS ACP PROCESSES PENNA.

# Technical Service Data Sheet
# Subject: Protecting Aluminum with "*ALODINE*"®

## INTRODUCTION

Aluminum not only corrodes when exposed unpainted to the atmosphere (particularly in moist, salt-laden air or industrial fumes) but also sheds paint unless the surface is actually changed prior to finishing. Simple treatments involving cleaning, or etching, or both, which heretofore have been used extensively, do not change the chemical composition of the surface and are inadequate. Far from retarding the corrosion of unpainted aluminum, such processes may in fact stimulate it.

In general, coatings integral with the aluminum itself have proved to be far more effective than cleaning and etching treatments for bonding paint and protecting the metal. "Alodine", which forms a stable, durable, non-metallic surface on aluminum, anchors the paint finish, prolongs paint life, and protects aluminum exposed unpainted in moist and salt-laden atmospheres.

| CHARACTERISTICS OF THE "ALODINE" COATING | |
|---|---|
| TYPE | Non-metallic surface, integral with aluminum it protects. |
| COLOR | Depending on alloy treated, color range is from an iridescent blue-green to a dark slate grey. |
| THICKNESS | From 0.01 to 0.08 mil. No appreciable dimensional changes occur when aluminum is Alodized. |
| WEIGHT | 50 to 300 mgs. per square foot. Optimum: 100 to 200 mgs. per square foot. |
| SOLUBILITY | Insoluble in water, alcohol, solvents, etc. Insoluble in most dilute acids and alkalis. However, strong acids and alkalis which attack aluminum may penetrate the "Alodine" film and react with the underlying metal. Slightly soluble in concentrated nitric acid. Soluble in molten sodium nitrate, etc. |
| ELECTRICAL RESISTANCE | High diaelectrical resistance. |
| HEAT STABILITY | Unimpaired at temperatures that melt aluminum. |
| FLEXIBILITY | Integral with and as flexible as the aluminum itself. Can withstand moderate draws. |
| ABRASION RESISTANCE | Approximately 90% of that provided by chromic acid anodized aluminum. |
| SALT SPRAY | Painted—superior to chromic acid anodizing. Unpainted—comparable with chromic acid anodizing. |
| PAINT-BONDING | Excellent. Equal to or superior to anodizing. |
| TOXICITY | Non-toxic. |
| BIMETALLIC CORROSION RESISTANCE | Shows good resistance against bimetallic or galvanic corrosion. |

## ALODIZING IS EASY AND EFFECTIVE

The Alodizing process is a chemical one and does not require electrolytic techniques or equipment. Alodizing is simple, foolproof, low in cost, and requires a minimum of equipment. Essentially, the process consists of the following easily controlled operations or steps:

1. Cleaning the work.
2. Rinsing the cleaned aluminum surfaces.
3. Coating with "Alodine."
4. Rinsing with clean water.
5. Rinsing with warm "Deoxylyte" (acidulated rinse).
6. Drying.

*After treatments.* Alodized aluminum provides an ideal bonding surface for paint, wax, adhesive, or other organic finishes. These should be applied in accordance with the manufacturer's directions. Unpainted or exposed areas will be protected by the tough, durable "Alodine" surface.

## "ALODINE" MEETS SERVICE SPECIFICATIONS

"Alodine" applied by immersion or spray complies with the rigid performance requirements of both industrial and Government specifications. The following is a list of Service Specifications which "Alodine" meets at the present time.

MIL-C-5541
MIL-S-5002
AN-F-20
U. S. Navord O.S. 675
16E4 (SHIPS)
AN-C-170 (See MIL-C-5541)
U.S.A. 72-53 (See AN-F-20)

## BRUSH "ALODINE" PROTECTS ALUMINUM IN THE FIELD, SHOP, OR HANGAR

Brush "Alodine" is easily applied in a simple brush-on or flow coat process to large assemblies and surfaces—airplanes, trucks, trailers, boats, housing, building siding, railway cars, bridges, etc.—that are too bulky or too remote to be conveniently treated in tanks or a multi-stage power spray washer. The cleaning and coating chemicals for Brush Alodizing are shipped in bulk or in the convenient Brush "Alodine" Chemical Kit No. 1. This Kit contains enough chemicals to treat about 1,000 square feet of surface and is an ideal package for use at airfields of commercial airlines or of the Armed Services anywhere.

CHEMICALS ACP PROCESSES

WRITE FOR FURTHER INFORMATION ON "ALODINE"
AND ON YOUR OWN ALUMINUM PROTECTION PROBLEMS.

CHEMICALS ACP PROCESSES

## AvGas Requirements to Rise 43% in Decade

WORLD-WIDE requirements for aviation gasoline, not counting either the U.S. military services or Russia and her satellites, are scheduled to rise nearly 43% in the next decade, according to a survey recently completed by the Interior Department's Petroleum Administration for Defense, and the agency's deputy administrator, J. Ed Warren, warns that unless U.S. oil companies step up production the needs may not be met.

The PAD study shows that:

• **U.S. consumption** of avgas by airlines, corporation aircraft, private flyers, and other civilian users will go from 21.3 million barrels in 1952 to 34.5 million barrels by 1962, an over 60% increase.

• **Foreign civilian and military** aircraft, which used up 27.6 million barrels last year, will require 35.4 million barrels in 1962, a 28% hike.

Putting the two together, the 49 million barrels of avgas burned last year will have to be upped to nearly 70 million by the time 1962 rolls around. Use of aviation gasoline by the U.S. armed forces will apparently not diminish to any appreciable extent—at least not enough to improve the outlook for civilian and foreign users.

Warren reported that estimates submitted to his agency by the Defense Department's Munitions Board show that avgas demand for U.S. military planes will continue upward for several years before leveling off.

### LOCAL SERVICE

| Carrier | Fuel (Gallons) | Oil (Gallons) | Total Cost (Fuel & Oil Combined) |
|---|---|---|---|
| Allegheny | 2,449,835 | 35,791 | $452,219 |
| Bonanza | 986,629 | 12,593 | 165,736 |
| Central | 1,263,602 | 20,279 | *229,191 |
| Empire | 528,751 | 5,464 | 99,648 |
| Frontier | 3,317,247 | 39,863 | 624,605 |
| L.A.S. | 105,553 | 968 | 20,422 |
| Mid Central | 782,307 | 8,153 | 132,729 |
| N.A. | 151,084 | 3,097 | 25,914 |
| North Central | 1,973,892 | 14,254 | 383,620 |
| Ozark | 1,519,559 | 13,140 | 299,906 |
| Pidgwest | 157,764 | 1,772 | 28,400 |
| New York Airways | 21,454 | 220 | 4,427 |
| Quark | 2,033,351 | 30,795 | 363,824 |
| Redmont | 3,559,630 | 54,749 | 632,292 |
| Pioneer | 3,741,130 | 55,648 | 669,538 |
| Resort | 3,007,076 | 44,196 | 960,767 |
| Southern | 2,341,571 | 31,318 | 458,918 |
| Southwest | 2,041,410 | 21,744 | 343,153 |
| Trans-Texas | 1,990,078 | 25,553 | 360,196 |
| West Coast | 1,535,114 | 15,732 | 260,892 |
| Wiggins | 125,617 | 2,269 | 30,132 |
| **TOTALS** | **33,632,654** | **437,598** | **$6,546,529** |

## 1952 Airline Gas-Oil Consumption

### DOMESTIC

| Carrier | Fuel (Gallons) | Oil (Gallons) | Total Cost (Fuel & Oil Combined) |
|---|---|---|---|
| American | 128,083,907 | 1,692,224 | $22,657,804 |
| Braniff | 17,692,512 | 216,699 | 2,895,210 |
| Capital | 32,057,908 | 321,273 | 5,726,467 |
| C & S | 10,936,480 | 110,069 | 1,843,085 |
| Colonial | 3,864,562 | 38,819 | 712,057 |
| Continental | 7,353,803 | 89,826 | 1,286,540 |
| Delta | 19,900,572 | 249,901 | 3,538,250 |
| Eastern | 90,753,752 | 986,015 | 15,999,522 |
| Mid-Continent (to Aug. 15) | 4,517,266 | 45,716 | 2,607,382 |
| National | 19,349,580 | 200,073 | 3,397,727 |
| Northeast | 3,963,344 | 50,906 | 756,007 |
| Northwest | 27,083,482 | 295,259 | 4,927,018 |
| TWA | 80,653,716 | 1,068,455 | 13,776,460 |
| United | 102,035,209 | 1,031,871 | 17,390,516 |
| Western | 11,764,944 | 143,252 | 2,104,793 |
| **TOTALS** | **560,011,037** | **6,540,358** | **$99,618,838** |

### INTERNATIONAL

| Carrier | Fuel (Gallons) | Oil (Gallons) | Total Cost (Fuel & Oil Combined) |
|---|---|---|---|
| American | 4,826,049 | 64,144 | $837,878 |
| Braniff | 6,282,875 | 65,335 | 1,598,579 |
| C & S | 2,670,877 | 29,626 | 593,499 |
| Colonial | 1,005,498 | 13,651 | 209,211 |
| Eastern | 7,919,752 | 92,502 | 1,305,159 |
| National | 1,332,927 | 11,697 | 233,793 |
| Northwest | 9,996,067 | 100,792 | 2,202,565 |
| PAA-Atlantic | 37,260,738 | 395,469 | *9,760,826 |
| PAA-Latin American | 42,104,680 | 373,862 | *8,781,696 |
| PAA-Pacific | 23,765,130 | 253,233 | *5,445,386 |
| PAA-Alaskan | 4,402,741 | 57,591 | *987,221 |
| Panagra | 8,008,059 | 80,635 | 2,291,666 |
| TWA | 24,460,398 | 282,436 | 6,359,008 |
| United | 7,481,331 | 94,491 | 1,376,526 |
| **TOTALS** | **181,517,122** | **1,915,464** | **$41,983,013** |

### ALL-CARGO

| Carrier | Fuel (Gallons) | Oil (Gallons) | Total Cost (Fuel & Oil Combined) |
|---|---|---|---|
| Flying Tigers | 7,209,507 | 111,164 | $1,390,890 |
| Slick | 8,664,594 | 90,237 | 1,460,185 |
| Riddle | 2,017,619 | 35,400 | 465,546 |
| **TOTALS** | **17,891,720** | **236,801** | **$3,316,621** |

### TERRITORIAL

| | | | |
|---|---|---|---|
| Alaska | 2,292,620 | 41,335 | $736,870 |
| Alaska, Coastal | 357,011 | 4,511 | 67,974 |
| Byers | 20,235 | 346 | 8,828 |
| Caribbean | 524,897 | 5,175 | 114,766 |
| Cordova | 105,009 | 960 | 8,489 |
| Ellis | 205,280 | 5,456 | 42,738 |
| Hawaiian | 2,417,334 | 33,763 | 415,267 |
| Northern Consol. | 629,585 | 6,403 | 247,104 |
| Pacific Northern | | | |
| Overseas | 1,467,624 | 16,987 | 296,374 |
| Alaskan | 732,344 | 8,018 | 180,093 |
| Reeve | 263,284 | 3,375 | 59,830 (as of June 30) |
| Trans-Pacific | 1,181,224 | 11,608 | 182,961 |
| Wien Alaska | (NA) | (NA) | 279,093 |
| **TOTALS** | **10,196,447** | **137,937** | **$2,640,387** |
| **GRAND TOTALS** | **803,248,980** | **9,268,158** | **$154,105,388**** |

* *12 months ending Sept. 30, 1952.*
*NA—Not Available*

*Source: Civil Aeronautics Board Records*
** *Including local service totals from table at left.*

**Removing an aircraft generator** used to be a rugged job. But G.E.'s Quick-Attach-Detach mount (above) now makes removal, installation a snap! G.E. is the **only company** able to offer the QAD to commercial users.

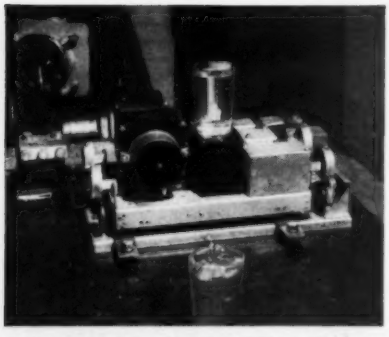
# Name your aircraft . . . G-E generator systems simplify maintenance jobs, meet any application

In a *fraction* of the time previously required, you can remove or install G-E generators equipped with Quick-Attach-Detach mounts. But this is just one of many technical features built into G-E generator systems.

G-E control panels, for example, are small, compact. Built on the "draw-out" principle, they are easy to remove and easy to service. G-E regulators and circuit breakers, too, consistently meet—and exceed—civil transport and military operating requirements.

Remember, complete G-E generator systems can be adapted to any existing drive in your aircraft. Whether you plan to use direct-drive, air turbine-drive, or hydraulic drive, a G-E system can be designed to work efficiently with it in either parallel or non-parallel operation.

G-E systems also meet all present-day electrical requirements. Generator and control components can handle 30 to 120 volts in d-c, 15 to 90 kva in a-c. For more information on the benefits that complete G-E systems can bring your aircraft, just clip the below coupon. Or contact your G-E Aircraft Specialist. *Section 210-78, General Electric Company, Schenectady 5, N. Y.*



**G-E CENTER-OF-GRAVITY MOUNT** can be used with G-E control panels, mounted in any position. Under 50 cps vibration, glass of water atop panel remains stable, while other splashes violently.

*You can put your confidence in—*

**GENERAL ELECTRIC**

**FREE BULLETIN**

Section 210-78
General Electric Company
1 River Road
Schenectady 5, N. Y.

- ☐ AC Generator Systems for Aircraft, GEA-5905A
- ☐ DC Generator Systems for Aircraft, GEA-5906
- ☐ Air Turbine Drives for Jet Aircraft, GEA-5870

√reference ×immediate project

Name..... Position.....
Company..... Project.....
City..... Zone..... State.....

# Engine Overhaul Periods in Hours

## For U. S. Aircraft in Scheduled Operation—1952

| Airline | Pratt & Whitney R-1830 | | Pratt & Whitney R-2000 | | Pratt & Whitney R-2800 | | Pratt & Whitney R-4360 | | Wright Aeronautical R-1820 | | Wright Aeronautical R-3350 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1951 | 1952 | 1951 | 1952 | 1951 | 1952 | 1951 | 1952 | 1951 | 1952 | 1951 | 1952 |
| Allegheny | -92<br>1000 | -92<br>1000 | | | | | | | | | | |
| American | | | 2SD13G<br>1400 | 2SD13G<br>1400 | -83AM3<br>1100<br>-83AM3<br>1400<br>-CB16<br>1000 | CA15<br>1100<br>CA15<br>1400<br>CB16<br>1100 | | | | | | |
| Bonanza | -92<br>1000 | -92<br>1000 | | | | | | | | | | |
| Braniff | S1C3G<br>1000 | -90D<br>1150 | | -7M2<br>1200 | | -83<br>1100<br>CB16<br>1000 | | | | | | |
| Capital | | | 7M2<br>1300 | 7M2<br>1400 | | | | | G-202A<br>1200 | G-202A<br>1200 | BA-3<br>1000 | BA-3<br>1100<br>BD<br>1200 |
| Central | -92<br>1000 | -90D<br>1000 | | | | | | | | | | |
| C & S | | | | | | | | | C9GC<br>1350 | C9GC<br>1450* | BD-1<br>1400 | BD-1<br>1700* |
| Colonial | | | -11M1<br>1300 | -11CM1<br>1300 | | | | | G-102<br>1225 | G-202A<br>1225 | | |
| Continental | S1C3G<br>1250<br>-92<br>1250 | S1C3G<br>1250<br>-92<br>1250 | | | | CA-18<br>1200<br>CB-16<br>1000 | | | | | | |
| Delta | | | M-4<br>1250 | | CA-15<br>1250 | | | | G-202<br>1250 | | | |
| Eastern | | | D-5 | D-5<br>1500<br>—7<br>1000 | | CB-3<br>1200 | | | | | | BD-1<br>1525<br>CA-1<br>1100<br>CA-2<br>900<br>CB-1<br>1000 |
| Frontier | -92<br>1000 | -92<br>1000 | | | | | | | | | | |
| Hawaiian | -92<br>1100 | S1C3G<br>1200 | | | | | | | | | | |
| Mohawk | | | | | | | | | 71&-75<br>1000 | G-202A<br>1100 | | |
| National | | | D-3<br>1500 | D-3<br>1500 | CA-15<br>1300 | CB-16<br>1300<br>R2800B<br>1000 | | | 202A<br>1250 | 202A<br>1350 | | |
| North Central | | | | | | | | | G-202A<br>700 | G-202A<br>900 | | |
| Northeast | -92<br>1200 | -92<br>1200 | | | CA-18<br>1100<br>CA-3<br>1100 | CA-3<br>1100 | | | | | | |
| Northwest | -90D<br>900 | S1C3G<br>1000 | -13B<br>1500 | 2 SD13G<br>1500<br>-9M2-9M3<br>1500 | CA-18<br>1100<br>CA3<br>1100 | | TSB3G<br>1000 | TSB3G<br>1000<br>B-6<br>1000 | | | | |
| Ozark | -90D<br>900 | -90D<br>900 | | | | | | | | | | |
| Pan American .....P.A.D. | | | D-3<br>-9M1<br>-11M2<br>-9M3<br>1500 | -13<br>1500 | | | TSB3G<br>900 | B-6<br>1000 | | | | |
| Pan American .....A.D. | | | | Various<br>1500 | | CB17<br>1000 | | TB3<br>1000 | | | | BA-3<br>1000 |
| Panagra | | | | | | | | | | | | |
| Piedmont | -92<br>1000 | -92<br>1000 | | | | | | | | | | |
| Pioneer | -90D<br>1100 | | | | | CA18<br>1000 | | | | | | |
| Slick | | | | | CB-16<br>1000 | CB-16<br>1100<br>-75<br>1100 | | | | | | |
| Southern | -90D<br>1100 | -90D<br>1100 | | | | | | | | | | |
| Southwest<br>Trans-Pacific | -92<br>1100 | -92<br>1200 | | | | | | | | | | |
| Trans-Texas | -90D<br>1100 | -90D<br>1200 | | | | | | | | | | |
| Trans World | | S1C3G<br>1500 | | -9<br>1500 | | CB-16<br>1300 | | | | G-202A<br>1500 | | BD-1<br>1600<br>BA-3<br>1200<br>CB-1<br>800 |
| United | S1C3G<br>1400 | S1C3G<br>1400 | -11C<br>1400 | -11C<br>1400 | CA-15<br>1500<br>CB16<br>1000 | CA-15<br>1500<br>CB16<br>1100<br>CB16<br>1000 | TSB3G<br>800<br>B-6<br>800 | B-6<br>800 | | | | |
| West Coast | -92<br>1150 | -92<br>1150 | | | -75<br>1300 | | | | | | | |
| Western | S1C3G<br>1300 | S1C3G<br>1300 | | -11M2<br>1400 | | CB-16<br>1000<br>CA-18<br>1400 | | | | | | |

* Testing for additional 100 hours

Note: Information on Eastern, Trans World and Western Airlines obtained from CAA records.

Source: American Aviation Survey

# Overhaul Times Raise 1500 Hour "Ceiling"

The 1500-hour "ceiling" on reciprocating engine overhaul times, an imaginary barrier that has existed since Northwest Airlines first reached that limit with its Pratt & Whitney R-2000 engines on November 9, 1949, went by the board in 1952. During the year, Chicago & Southern Air Lines received permission from the Civil Aeronautics Administration to operate the Wright R-3350 BD engines on its Lockheed 649's 1600 hours between overhauls, and today C&S has an approved time of 1700 hours, with three engines being tested for 1800 hour approval.

Trans World Airlines and Eastern Air Lines are following close on the heels of C&S. TWA has an approved time of 1600 hours for the BD engine; EAL overhauls the same model engine at 1525 hours.

But the R-3350 is the lone contender on the path to a 2000-hour engine period. Pratt & Whitney's 28-cylinder R-4360 engine, in its fourth year of service on Boeing 377 airplanes, has reached a top overhaul time of 1000 hours; and the newer R-2800-CB16 has an average limit below 1100 hours for eight airlines surveyed. Other P&W engine times, all well below the R-3350, are 1200 hours average for the R-2800-CA15, and the 1400 hours average for the R-2000.

The Wright G-202 and P&W R-1830 engines, used to power the Douglas DC-3 series, have levelled off at overhaul periods in the 1100-1200 hour range, with little change noticed over 1951.

For the leader in the field of engine overhaul times, Chicago & Southern, the longer engine periods have brought lower overhaul costs per flight-hour while a consistently low premature removal rate has been maintained. For 1952 C&S boasts an overhaul cost of $3.49 per flight-hour (compared with a norm of $4-5) and an unscheduled removal rate of 0.05 per 1000 engine-hours flown, the equivalent of a failure every 20,000 engine hours of operation.

Before relinquishing its position as prime mover of transport aircraft to its fast approaching turbojet successor, the piston engine is bent upon setting some new high standards for the jet to aim at. The most impressive of these, though still to come, is a 2000-hour overhaul span. Present indications are that this standard will be set, perhaps in 1953, but if not, surely in 1954. • • •

## Milestone

**Orville Wright demonstrated his automatic pilot and was awarded the Collier Trophy for 1913.**

**December 31, 1913**

## NEWS BRIEFS

CAA has issued a **mandatory inspection item,** requiring inspection of and corrective action for low pitch stop assemblies of Hamilton Standard reversing props. To be complied with no later than April 30, inspection applies to all Boeing B-377's, Convair 240's and 340's, Douglas DC-6's, Lockheed 049's, and Martin 2-0-2's and 4-0-4's.

• •

**Land-Air, Inc.** has been awarded a Navy contract for more than $1,000,000 calling for manufacture, installation, maintenance, and training of Navy crews in use of aircraft analyzers.

## Milestone

**First wholly automatic landings in history made at Wright Field by Capt. Carl Crane with two passengers.**

**August 23, 1937**

## Aircraft Seating

| Airline | Douglas DC-3 | DC-4 Coach | DC-4 Reg. | DC-6 Coach | DC-6 Reg. | DC-6B Coach | DC-6B Reg. | Lockheed 6-7-1049 Reg. | Boeing 377 Coach | Boeing 377 Reg. | Convair 240 | Convair 340 | Martin 202 | Martin 404 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Allegheny | 24 | ..... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| American | .... | 65 | ..... | 70** | 52 | ..... | 52 | .... | .... | .... | 40 | .... | .... | .... |
| Bonanza | .... | ..... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| Braniff | 21-24 | ..... | 48 | .... | 52 | .... | .... | .... | .... | .... | .... | 44 | .... | .... |
| Capital | 24 | ..... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| Central | 24 | ..... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| C & S | 21 | ..... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| Colonial | 26 | ..... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| Continental | 21 | ..... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| Delta | 25 | ..... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| Eastern | .... | 68 | ..... | .... | .... | .... | .... | 66-88 | .... | .... | .... | .... | .... | 40 |
| Frontier | 24 | ..... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| Hawaiian | 24 | ..... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| Mohawk | 24 | ..... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| National | .... | 61 | ..... | .... | 58 | .... | 66 | .... | .... | .... | .... | .... | .... | .... |
| North Central | 21 | ..... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| Northeast | 24 | ..... | ..... | .... | .... | .... | .... | .... | .... | .... | 40 | .... | .... | .... |
| Northwest | 21 | 10 @ 62<br>1 @ 66 | 5 @ 32<br>7 @ 50 | .... | .... | .... | .... | .... | .... | 75* | .... | .... | .... | .... |
| Ozark | 8 @ 28<br>2 @ 21 | ..... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| PAA-AD*** | .... | 56 | 30-56 | .... | .... | 80 | 44-56 | 45 | 86 | 47-60 | .... | .... | .... | .... |
| P.A.A.-PAD | .... | ..... | 31-54<br>-29-41 | .... | .... | .... | 48 | 43 | 81 | 47-56-61 | .... | .... | .... | .... |
| Panagra | 21 | ..... | 46 | 70 | 52 | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| Piedmont | 24 | ..... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| Pioneer | .... | ..... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 36 | .... |
| Slick | .... | ..... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| Southern | 8 @ 24<br>1 @ 21 | ..... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| Southwest | 28 | ..... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| Trans-Pacific | 28 | ..... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| Trans-Texas | 21 | ..... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| Trans World | 21 | ..... | ..... | 60-70 | 40 | .... | .... | **** | .... | .... | .... | .... | 36 | 40 |
| United | 21 | 66 | ..... | .... | 50 | .... | 58 | .... | .... | 56 | .... | 44 | .... | .... |
| West Coast | 24 | ..... | ..... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| Western | 22 | 66 | 44 | .... | .... | .... | 66 | .... | .... | .... | 40 | .... | .... | .... |

** Being increased to 83*

*** Being increased to 80*

**** PAA-AD—Atlantic Div.*

***** TWA Lockheed 49-46 (57 & 81 seats); 749 (49 & 57 seats); 749A (38, 49 and 61 seats); 1049 (71 seats)*

*Source: American Aviation Survey*

## NEWS BRIEFS

National Advisory Committee for Aeronautics' **17% budget cut** from $77,630,000 to $64,439,000 for fiscal 1954 will hit its planned construction program hardest. Revised budget allows $7,239,000 (Truman had requested $14,600,000), which eliminates plans for a rocket engine research facility and a variable Mach number nozzle for supersonic wind tunnel. Salaries and expenses have been dropped to $5,830,000.

• •

**The Glenn L. Martin Co.** has appointed C. B. Allen, former aviation reporter for the *New York Herald Tribune*, to a public relations post and Barney Capehart, formerly sales representative for Emeco, Inc., as assistant to Jess W. Sweester, vice president of contracts.

### Milestone

The Douglas DC-4, the world's largest landplane, makes its first public appearance in a flight from Chicago to New York with 40 passengers aboard.

June 1, 1939


Van Dusen DOODLES.....

Him? Got him at Van Dusen, natch, they've got everything there!

Van Dusen AIRCRAFT SUPPLIES
Every Aircraft Need from ONE Source
TETERBORO, N. J. MINNEAPOLIS, MINN. BOSTON, MASS.



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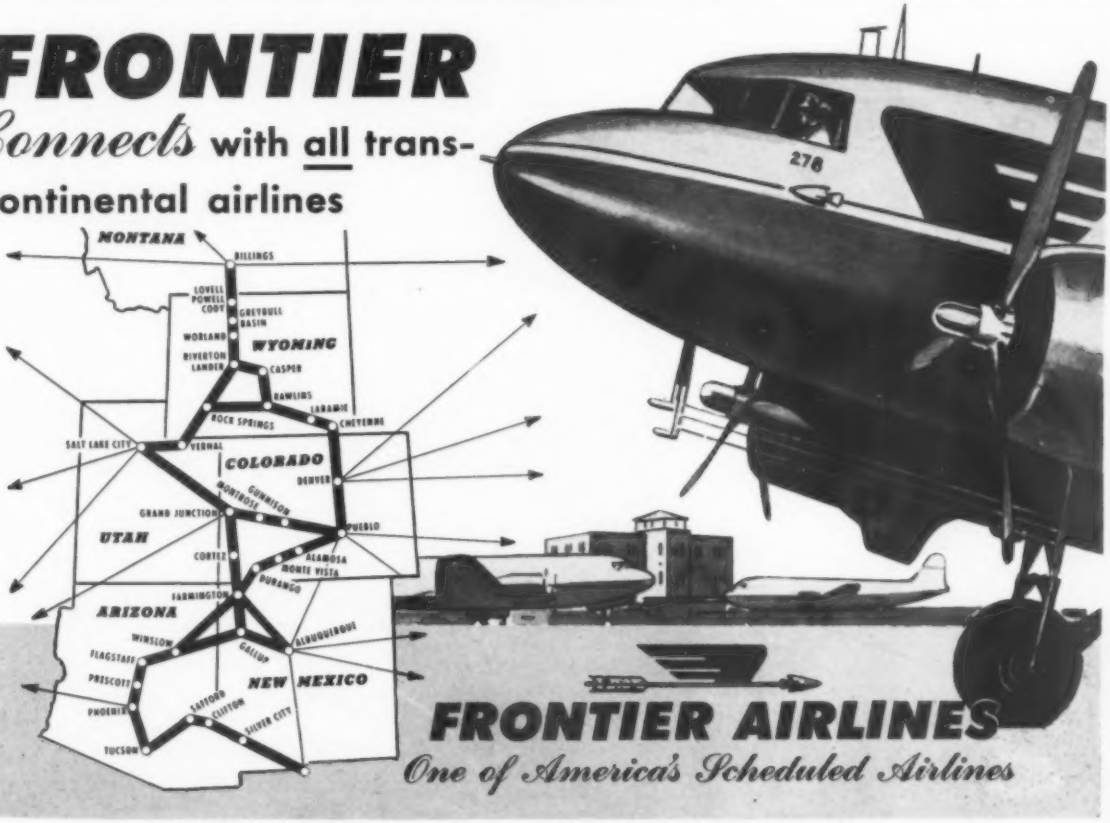
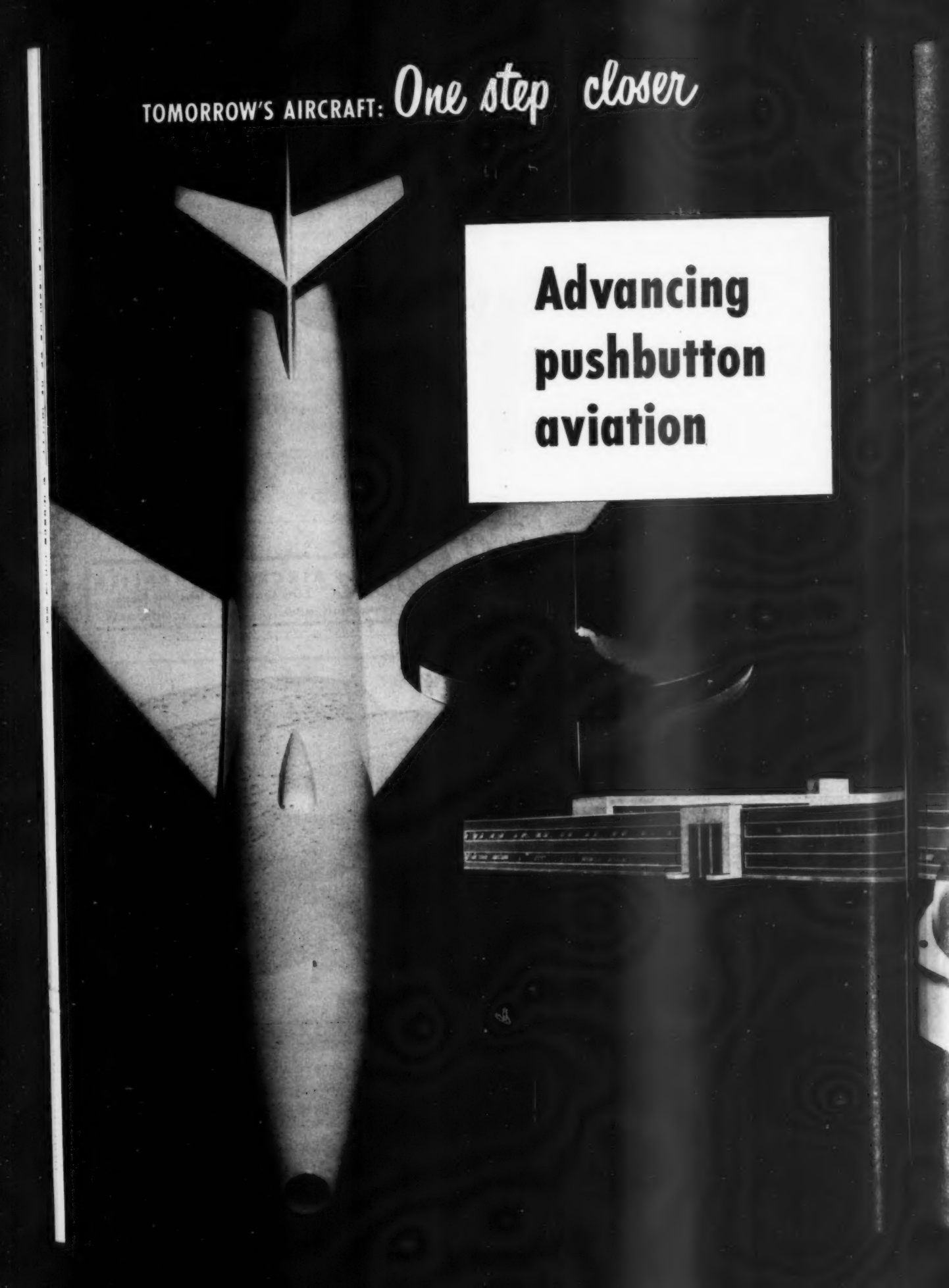
Connects with all trans-continental airlines



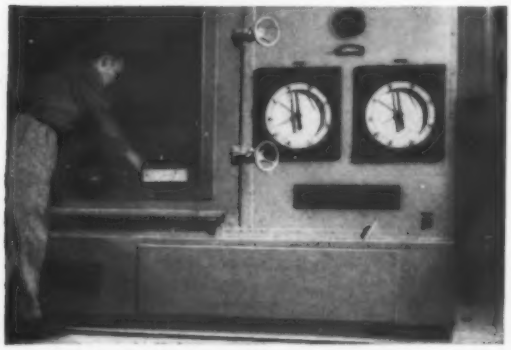

FRONTIER AIRLINES
One of America's Scheduled Airlines


TOMORROW'S AIRCRAFT: One step closer
Advancing pushbutton aviation

An impressive concentration of top aviation engineers and electronic specialists was recently assigned to the new Westinghouse Air Arm Division in Baltimore. The huge plant, occupying 75 acres next to the Baltimore Friendship Airport, has space to integrate all Westinghouse air-borne electronic engineering, testing and production facilities into one operation . . . with the opportunity for both air-borne and environmental testing.

Already this division has designed, tested and put into production some outstanding developments. One is the Westinghouse Autopilot, the first automatic pilot to utilize three "non-tumbling" gyroscopes and to provide unlimited maneuverability. Also of great value to our nation's military needs are the tremendous advances made on complete fire-control systems and guided missile systems.

These rapid strides were possible because of unmatched resources, such as: a Flight Engineering Department with hangar and company-owned planes . . . an REAC Analog Computer with flight simulator equipment . . . environmental test facilities, such as the one illustrated below . . . and a large staff of trained service engineers. All these Westinghouse facilities under one roof for one purpose—*advancing tomorrow's pushbutton aviation.* Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-91004



**This Atmospheric Chamber** simulates conditions from −65° to +160° centigrade, altitudes up to 80,000 feet. It also varies humidity 20 to 95 per cent and automatically controls these variable conditions to any pre-set values.

## THE SCOPE OF WESTINGHOUSE IN AVIATION

**Basic aircraft systems**

Turbojet Engines, Fire Control, Radar, Autopilots, Communication Equipment and Electrical Systems.

**Ground equipment**

Wind Tunnels, Airport Lighting, Industrial Plant Apparatus.

**Air-borne system components**

Transformers, Rectifiers, Instruments, Gyro-motors, Temperature Control Panels, Generating Equipment and System Control, Circuit Breakers, Contactors, Motors, Actuators and Hoists, Electronic Tubes, Magamps*, Micarta®.

*Trademark

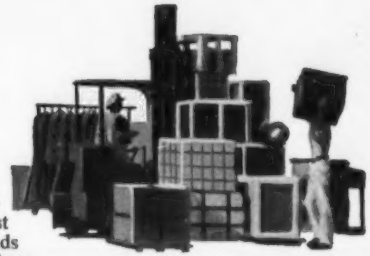
YOU CAN BE **SURE**...IF IT'S

# Westinghouse

*Leadership demands constant achievement*

## Air freight gets a new lift...via

# SUPER CONSTELLATION



**FARTHER—FASTER—CHEAPER!** This has been the objective of all transportation since man invented the wheel. And civilization itself has progressed in direct ratio to improvements made in transportation.

Now, the new all-cargo Super Constellation will carry more things *farther-faster-cheaper than any commercial plane*. It will carry 35,000 pounds of cargo coast-to-coast in less than 8½ hours at the lowest cost in history. It will carry 27,500 pounds New York to London *non-stop* in less than 14 hours! That's a new lift for air freight.

All-cargo Super Constellations will soon serve Seaboard & Western and other leading operators.

# LOCKHEED

AIRCRAFT CORP., BURBANK, CALIF., & MARIETTA, GA.

*Look to Lockheed for Leadership*

**TWENTY LEADING AIRLINES CHOOSE CONSTELLATIONS AND SUPER CONSTELLATIONS** — UNITED STATES: Capital Airlines, Chicago & Southern Air Lines, Eastern Air Lines, Pan American World Airways, Seaboard & Western, Trans World Airlines. OVERSEAS: Air France, Air India, AVIANCA, Braathens, B.O.A.C., El Al Israel, Iberia, KLM, LAV, Pakistan International, Panair do Brasil, QANTAS, South African Airways, Trans-Canada.

# LOCKHEED'S

## NEW SUPER HAULS FREIGHT FASTER, CHEAPER

On the opposite page you see illustrated the rear loading area of a big Super Constellation 1049-D, designed to carry more freight farther, faster and cheaper than ever before in history—closely approaching the sought-after 5¢ per ton-mile operating cost.

This all-cargo version of the Super Constellation culminates 7 years of special cargo research by Lockheed and is so different from the passenger versions that the fuselage requires separate production jigs.

The 1049-D utilizes the most economical form of power available to aircraft, the turbo-compound engine. Four of these Wright engines, each rated 3250 horsepower for take-off, give the Super Constellation a 332-mph cruising speed at 20,000 feet. It will fly the 3,459 miles from New York to London non-stop in 13½ hours with a payload of 14 tons, crew of 5 and full over-water equipment—will fly 24,500 lbs. non-stop to Berlin.

### DESIGNED TO CUT COSTS

The Super Constellation was designed for "loadability," so as to assure maximum efficiency and cut costs in man-hours.

Total usable payload volume is 5568 cu. ft., equivalent to a storeroom 46.4 ft. by 15 ft. and 8 ft. high. Total floor area for cargo is 1032 sq. ft.

The integrated all-magnesium floor is the finest being installed in any air transport today, according to both commercial and military operators who have inspected it. Concentrated loads from skids and legs may exert up to 400 lbs. per square inch. Floor loads of 1000 lbs. per lineal foot or 300 lbs. per square foot may be applied in the main cabin.

### SPECIAL TIE-DOWNS AND BUILT-IN CONVEYOR

Floor tie-down fittings in a grid pattern of approximately 20" x 20" provide for loads of 4,000 lbs. in any direction. Wall tie-downs will take up to 4,500 lbs. each.

At a push of a button the built-in conveyor will pull (or *push*) loads over 12,000 lbs. on rollers or dollies or will skid a load of 8,000 lbs., reducing man power to a minimum.

The all-cargo Super Constellation is completely heated, pressurized and refrigerated. Normal equipment includes dual heaters, superchargers and refrigeration units. This gives cargo operators complete freedom in operational planning and insures protection of the cargo, regardless of its type or the nature of the operation.

# Record Year for Non-Carrier Production

CIVILIAN non-carrier production in 1952 registered its first all-time high since the boom year of 1946. Deliveries were up 32.8% over 1951 and dollar value of shipments rose 54.9%. The year saw shipment of 3,058 one-to-ten-place aircraft valued at $26,159,000, compared with 2,303 aircraft valued at $16,887,000 shipped the previous year.

| | Aircraft Shipments (complete units) | | Mfrs. Net Billing (thousands of $s) | |
|---|---|---|---|---|
| | 1952 | 1951 | 1952 | 1951 |
| Aero Design | 39 | .... | 2,011 | .... |
| Aeronca ... | NP | 34 | .... | 101 |
| Beech ..... | 414 | 429 | 9,848 | 7,708 |
| Bellanca ... | NP | 11 | .... | 106 |
| Call Air ... | NP | 3 | .... | 13 |
| Cessna .... | 1,373 | 551 | 9,220 | 3,573 |
| Eng. & Research . | 1 | 7 | 4 | 24 |
| Luscombe . | 1 | 42* | 3 | 132* |
| Mooney ... | 49 | 26 | 100 | 45 |
| Piper ..... | 1,161 | 1,082 | 4,891 | 3,933 |
| Ryan ..... | NP | 104 | .... | 1,215 |
| Taylorcraft | 20 | 14 | 82 | 37 |
| TOTALS .. | 3,058 | 2,303 | 26,159 | 16,887 |

*NP: no production reported for 1952.*
** Includes 7 GC-1B's valued at $27,000 shipped by Texas Engineering.*
*Figures compiled by Utility Airplane Council of AIA.*

While 33,000 lightplanes were produced in 1946, 90% of the total were one- and two-placers. The 1952 shipments showed that over 82% of the aircraft built were four-place or more.

Joseph Geuting, manager of the Utility Aircraft Council of the Aircraft Industries Association, points out that the transition of the lightplane from essentially a trainer-sport plane to an efficient tool of business is reflected in today's aircraft use. All but a very small percentage of the aircraft produced by the six companies engaged in active civilian lightplane output—Aero Design, Beech, Cessna, Mooney, Piper, and Taylorcraft—are being purchased for business, industry, and agriculture.

Piper Aircraft Corp. made a survey among its Pacer customers to determine uses of the aircraft, and it found that 90% of the Pacers purchased during 1952 (682) were being used in some form of business activity.

Because of the growing demand for executive aircraft, all companies are stepping up their schedules for civilian production in 1953. The "big four" of the lightplane industry have issued the following tentative schedules:

• **Aero Design and Engineering Co.:** 100 Aero Commanders;

• **Beech Aircraft Corp.:** 340 Bonanzas; 50 Model D18S Beechcrafts; 100 Model 50 Twin Bonanzas: total 490;

• **Cessna Aircraft Co.:** More than 1,800 on all models;

• **Piper Aircraft Corp.:** Over 1,400 on all models, exclusive of Twin Piper.

The first two months of 1953 indicate that chances of meeting the above schedules are good. In January and February the four companies above, plus Taylorcraft, shipped a total of 637 aircraft for a dollar value of $5,991,000. This contrasts with 383 aircraft valued at $3,399,000 for the same period in 1952.

The one drawback to this propitious beginning for 1953 is the threat posed by decontrol regulations on controlled materials established by the new administration. The new system gives no priority rating for civilian lightplane production after June 30. If there is a step-up in military and transport production, or if either of the two needs more materials and components, the lightplane production picture could change for the worse.

## Small Twin

There is a very definite need among executive and corporation aircraft users for a small twin-engine, four- or five-place aircraft. The majority of the single-engine operators represent a large potential market for such a model.

In line with this several companies have designed and are anticipating production on twin-engine lightplanes.

Piper early in 1952 announced its twin, and the prototype was flown in the fall. The schedule calls for completing the flight model in June, the first two production models in August. Company officials anticipate having 50 completed by February, 1954, and expect to be on a two-a-day production basis by May, 1954. Cost will be kept to $25,000.

Cessna, too, announced a twin-engine aircraft with anticipated production in 1954. No specifications were released but sources say the cost of the aircraft equipped with tip tanks will be in the $45,000 category.

Aeronca, out of the civilian lightplane market in 1952 because of defense parts production, is rumored to be designing an aircraft in the twin-engine configuration. It is believed to be in the mock-up stage, but president J. A. Lawler states that no production plans can be made for some time to come. His engineers have been working on development of such an aircraft in their spare time. But, he stated, the press of defense orders can keep such a design off the market for at least five years.

## On-Time Operation

### U. S. Scheduled Airlines

| Airline | % Route Mileage Completed | On-Time Operation Best Summer Month | On-Time Operation Best Winter Month |
|---|---|---|---|
| Allegheny | 92.26 | NA | NA |
| American | 97.7 | 39.5 | 34.9 |
| Bonanza | 98.0 | NA | NA |
| Braniff | 96.47D<br>97.41F | NA | NA |
| Capital | 96.85 | 65.25 | 58.65 |
| Central | 97.73 | 90.00 | 83.00 |
| C & S | 98.06 | NA | NA |
| Colonial | 96.3 | 71.2 | 76.9 |
| Continental | 99.52 | NA | NA |
| Delta | 99.00 | 91.6 | 86.7 |
| Eastern | NA | NA | NA |
| Frontier | 98.36 | NA | NA |
| Hawaiian | 99.43 | NA | NA |
| Mohawk | 94.17 | 82.6 | 82.6 |
| National | 97.71 | NA | NA |
| North Central | 91.55 | 78.82 | 61.33 |
| Northeast | 91.46 | NA | NA |
| Northwest | 95.8 | NA | NA |
| Ozark | 94.38 | NA | NA |
| Pan American | | | |
| Atlantic Div. | NA | NA | NA |
| Lat. Amer. Div. | NA | NA | NA |
| Pacific Div. | 99.53 | 52.0 | 60.0 |
| Piedmont | 98.55 | NA | NA |
| Pioneer | 98.0 | 76.0 | 75.0 |
| Slick | 72.4 | 76.3 | 67.9 |
| Southern | 98.47 | NA | NA |
| Southwest | 96.67 | NA | NA |
| Trans-Pacific | 99.36 | 92.0 | 92.0 |
| Trans-Texas | 98.04 | NA | NA |
| Trans World | NA | NA | NA |
| United | 96.9 | 77.0 | 78.0 |
| West Coast | 94.6 | NA | NA |
| Western | NA | NA | NA |

*NA—Not available. All data shown are taken from airline answers to an* AMERICAN AVIATION *survey.*

*NOTE: Airline concentration over the past three years on improved "on-time" operations has brought results. The percentage of schedules completed for all operators now averages out at 96.8%, just 3.2% short of 100% operation. Variations in "on-time" percentages are to some degree due to the different methods used by operators to compute on-time records. Some use precise schedules and count all delays down the line; others allow tolerances up to 15 minutes of schedule time without charging delay. For this reason these figures must be weighed carefully.*

## Crew Utilization

| Airline | Pilots Copilots No. | Pilots Copilots Util. | Flight Engineers No. | Flight Engineers Util. | Navigators No. | Navigators Util. | Cabin Attendants No. | Cabin Attendants Util. |
|---|---|---|---|---|---|---|---|---|
| Allegheny | 65 | 80:00 | .... | .... | .... | .... | 31 | 85:00 |
| American | 1146 | 75:26 | 274 | 70:33 | 24 | NA | 802 | 73:36 |
| Bonanza | 29 | 82:00 | .... | .... | .... | .... | 14 | 83:00 |
| Braniff | 378 | 75:20 | 44 | 74:50 | .... | .... | 236 | 81:50 |
| Capital | 447 | 80:15 | 18 | 78:50 | 9 | 72:00 | 250 | 80:05 |
| Central | 40 | 82:00 | .... | .... | .... | .... | 20 | 82:00 |
| C & S | 170 | 69:00 | 31 | 64:00 | .... | .... | 102 | 73:00 |
| Colonial | 94 | 71:00 | .... | .... | 6 | 62:00 | 61 | 78:00 |
| Continental | 119 | 79:00 | 5 | 75:00 | .... | .... | 68 | 79:00 |
| Delta | 274 | 65:00 | .... | .... | .... | .... | 140 | 71:00 |
| Eastern | 895 | NA | 173 | NA | .... | .... | 642 | NA |
| Frontier | 84 | 78:00 | .... | .... | .... | .... | 44 | 75:00 |
| Hawaiian | 73 | 80:00 | .... | .... | .... | .... | 32 | 83:00 |
| Mohawk | 48 | 80:00 | .... | .... | .... | .... | 22 | 84:00 |
| National | 240 | NA | 51 | NA | .... | .... | 160 | NA |
| North Central | 70 | 80:00 | .... | .... | .... | .... | 34 | 77:00 |
| Northeast | 90 | 81:00 | .... | .... | .... | .... | 48 | 60:00 |
| Northwest | 436 | 79:24 | 47 | 76:06 | 59 | 71:06 | 308 | 76:36 |
| Ozark | 55 | 77:00 | .... | .... | .... | .... | 26 | 78:00 |
| Pan American PAD | 300 | 65:06 | 63 | 63:48 | .... | .... | 190 | 72:22 |
| Pan American AD | 680 | NA | 252 | NA | .... | .... | 145 | NA |
| Panagra | 47 | NA | 119 | NA | .... | .... | 82 | .... |
| Piedmont | 96 | 81:00 | .... | .... | .... | .... | 41 | 84:00 |
| Pioneer | 54 | 82:30 | .... | .... | .... | .... | 28 | 85:00 |
| Slick | 146 | 80:00 | 11 | 72:00 | 2 | 80:00 | .... | .... |
| Southern | 57 | 77:30 | .... | .... | .... | .... | 28 | 73:00 |
| Southwest | 57 | 80:00 | .... | .... | .... | .... | 28 | 85:00 |
| Trans-Pacific | 30 | 82:00 | .... | .... | .... | .... | 13 | 82:00 |
| Trans-Texas | 48 | 77:32 | .... | .... | .... | .... | 25 | 73:31 |
| Trans World | 1029 | NA | 514 | NA | .... | .... | NA | .... |
| United | 1177 | 70:18 | 289 | 72:28 | 43 | 72:00 | 818 | 76:01 |
| West Coast | 75 | 76:30 | .... | .... | .... | .... | .... | .... |
| Western | 206 | NA | .... | .... | .... | .... | .... | .... |

*Note: All utilization figures shown are average/month for year 1952.*
*Source—American Aviation Survey.*

## Peak Trip Frequencies

| AIRLINE | Route | Daily *Trips | Route | Daily *Trips | Route | Daily *Trips |
|---|---|---|---|---|---|---|
| Allegheny | Pittsburgh-Johnston | 15 | Johnston-Altoona | 12 | Newark-Scranton | 10 |
| American | New York-Washington | 70 | | | New York-Boston | 55 |
| Bonanza | Phoenix-Las Vegas | 6 | | | New York-Chicago | 56 |
| Braniff | Kansas City-Minneapolis | 22 | Dallas-San Antonio | 18 | Dallas-Houston | 17 |
| Capital | Detroit-Washington | 64 | | | | |
| Central | Fort Worth-Dallas | 10 | | | | |
| C & S | Chicago-St. Louis | 16 | St. Louis-Memphis | 13 | Memphis-Little Rock | 12 |
| Colonial | New York-Albany | 10 | | | | |
| Continental | Denver-Colorado Springs | 12 | Denver-Kansas City | 10 | San Antonio-El Paso | 8 |
| Delta | Atlanta-Dallas | 21 | Shreveport-Dallas | 20 | Dallas-New Orleans | 17 |
| Eastern | New York-Washington | 66 | | | | |
| Frontier | Phoenix-Prescott | 6 | Prescott-Flagstaff | 6 | Flagstaff-Winslow | 6 |
| Hawaiian | Honolulu-Kahului | 26 | Honolulu-Hilo | 18 | Honolulu-Lihue | 16 |
| Mohawk | Ithaca-Newark | 7 | | | | |
| National | New York-Miami | 24 | Jacksonville-Tampa | 15 | Tampa-Miami | 12 |
| North Central | Milwaukee-Chicago | 18 | Madison-Chicago | 14 | Oshkosh-Green Bay-Chicago | 8 |
| Northeast | Boston-New York | 9 | | | | |
| Northwest | Chicago-Minneapolis | 24 | Minneapolis-Milwaukee | 16 | Seattle-Spokane | 14 |
| Ozark | St. Louis-Chicago | 6 | | | | |
| PAA-PAD | Seattle-Fairbanks | 6 | San Francisco-Honolulu | 5 | | |
| Panagra | Quito-Guayaquil | 3 | | | | |
| Piedmont | Tricity-Lexington | 16 | | | | |
| Pioneer | Dallas-Abilene | 10 | Dallas-Lubbock | 8 | Dallas-Midland-Odessa | 6 |
| Slick | Chicago-New York | 7 | | | | |
| Southern | Atlanta-Columbus (Ga.) | 8 | | | | |
| Southwest | Los Angeles-San Francisco | 5 | | | | |
| Trans-Pacific | Honolulu-Lihue | 6 | | | | |
| Trans-Texas | Corpus Christi-Beeville | 8 | Dallas-Beaumont | 6 | Dallas-St. Angelo | 6 |
| United | Chicago-New York | 46 | San Francisco-Los Angeles | 44 | | |
| West Coast | Seattle-Medford (Ore.) | 3 | | | | |
| Western | Los Angeles-Burbank-San Francisco | 22 | | | | |

** One way trips*

*Source: American Aviation Survey*

# TARGET SELECTION

Hitting the selected target has been a prime problem since man first armed himself. However, unlike the problem which faced the primitive native with his bow and arrow, selecting targets for guided missiles involves many new techniques.

Fairchild's Guided Missiles Division was among the first in this country to undertake the design and development of complete missile guidance systems. The systems have been proven in test missiles flown by all three branches of the Armed Services and are among the most advanced types.

Research in the Fairchild Guided Missiles laboratories includes all the basic guidance systems such as surface-to-air, air-to-air and air-to-surface missiles. The division has developed an engineering and production team experienced not only with guidance systems but also with the aerodynamic, structural and propulsion problems associated with missiles.

ENGINE AND AIRPLANE CORPORATION

**FAIRCHILD**

*Guided Missiles Division*

WYANDANCH, L. I., N. Y.

Engine Division, Farmingdale, L. I., N. Y. • Aircraft Division, Hagerstown, Md.

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## Worldwide Directory Of Air Lines

### North America

#### UNITED STATES

**Aerovias Sud Americana, Inc.**, Pinellas Int'l Airport, St. Petersburg, Fla.
*Equipment:* Curtiss C-46's

**Allegheny Airlines, Inc.** (Formerly All-American Airways, Inc.) Washington National Airport, Hangar No. 12, Washington 1, D. C.
*Equipment:* 12 Douglas DC-3's
*Total Employees:* 473

**American Airlines, Inc.**, Executive, sales, treasury and personnel offices: 100 Park Ave., New York 17, N. Y. Operations & engineering offices: New York Airport Station, Flushing 71, N. Y.
*Equipment:* 14 DC-4's; 49 DC-6's; 17 DC-6B's; 78 Convair 240's; *On Order:* 3 DC-6A's; 25 DC-7's
*Total Employees:* 15,150

**Bonanza Air Lines, Inc.**, P. O. Box 391, McCarren Field, Las Vegas, Nevada
*Equipment:* DC-3's

**Braniff Airways, Inc.**, Love Field, Dallas 19, Texas
*Equipment:* 32 DC-3's; 8 DC-4's; 9 DC-6's; 26 Convair 340's; *On Order:* 2 Convair 340's
*Total Employees:* 4,218
*Pilots Employed:* 421

**Capital Airlines, Inc.**, Washington National Airport, Washington 1, D. C.
*Equipment:* 25 DC-3's; 25 DC-4's; 7 Lockheed Constellations
*Total Employees:* 4,332
*Pilots Employed:* 486

**Caribbean-Atlantic Airlines, Inc.**, P. O. Box 3214, San Juan, Puerto Rico
*Equipment:* 3 DC-3's

**Catalina Air Transport**, Catalina Airport, Avalon, California

**Central Airlines, Inc.**, Meacham Field, Ft. Worth, Texas
*Equipment:* 6 DC-3's; 1 Beech A-35

**Chicago and Southern Air Lines, Inc.**, General Offices: Memphis Municipal Airport, Memphis 14, Tennessee
*Equipment:* 12 DC-3's; 6 Constellations; *On Order:* 7 Convair 340's
*Total Employees:* 1,462
*Pilots Employed:* 168

**Colonial Airlines, Inc.**, Executive Offices: 230 Park Avenue, New York 17, N. Y.
*Equipment:* 8 DC-3's; 4 DC-4's
*Total Employees:* 652
*Pilots Employed:* 86

**Continental Air Lines, Inc.**, Stapleton Airfield, Denver 7, Colorado
*Equipment:* 10 DC-3's; 7 Convair 340's; 2 DC-6B's; 1 Convair 240 (leased from AA); 1 DC-6B (leased from UAL); *On Order:* 2 DC-6B's
*Total Employees:* 880
*Pilots Employed:* 117

**Delta Air Lines, Inc.**, Atlanta Municipal Airport, Atlanta, Georgia
*Equipment:* 7 DC-6's; 10 Convair 340's; 3 DC-3's; *On Order:* 4 DC-7's
*Total Employees:* 2,760
*Pilots Employed:* 278

**Eastern Air Lines, Inc.**, Eastern Air Lines Building, 10 Rockefeller Plaza, New York 20, N. Y.
*Equipment:* 14 Super Constellations; 20 Constellations; 60 Martin 4-0-4's; 11 DC-4's; 5 DC-3's; *On Order:* 16 L-1049C's
*Total Employees:* 9,285
*Pilots Employed:* 538, Chief Pilots: 5; Check Pilots: 28; Captains: 334.
*Flight Engineers:* 156

**The Flying Tiger Line, Inc.**, Lockheed Air Terminal, Burbank, California
*Equipment:* 12 DC-4's; 26 C-46's; *On Order:* 1 DC-6A's
*Total Employees:* 1,826
*Pilots Employed:* 303

**Frontier Airlines, Inc.**, Stapleton Airfield, Denver 7, Colorado
*Equipment:* 12 DC-3's

**Hawaiian Airlines Limited**, Inter-Island Bldg., P. O. Box 3287, Honolulu 1, T. H.
*Equipment:* 10 DC-3's; 2 Convair 340's; 3 DC-3's (Cargo)
*Total Employees:* 500
*Pilots Employed:* 77

**Helicopter Air Service, Inc.**, 5036 W. 63rd St., Chicago 38, Illinois
*Equipment:* 6 Bell 47 D's


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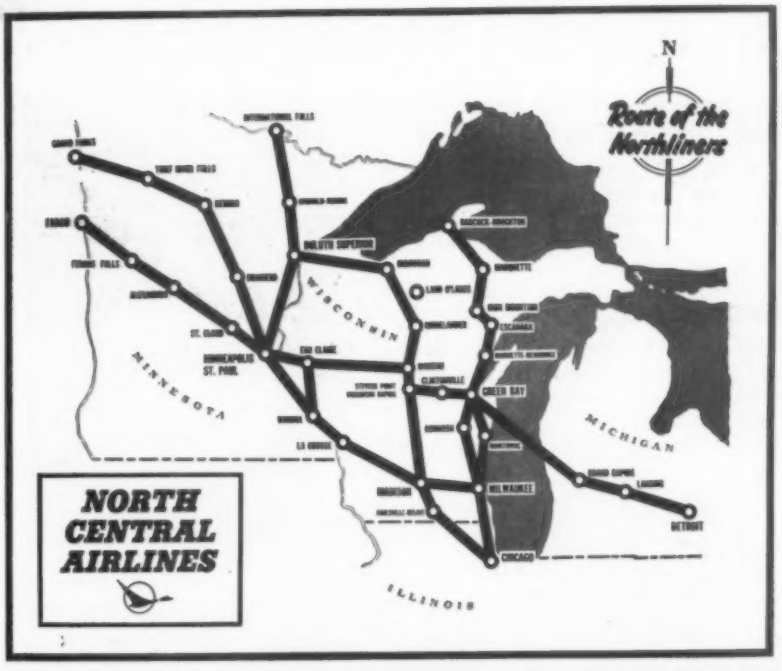


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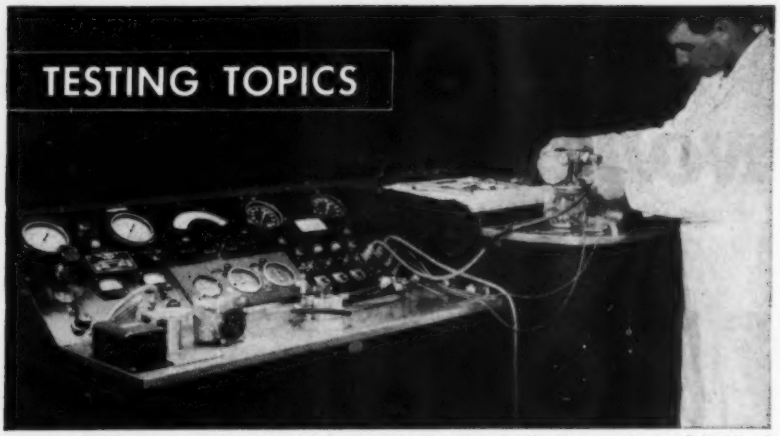
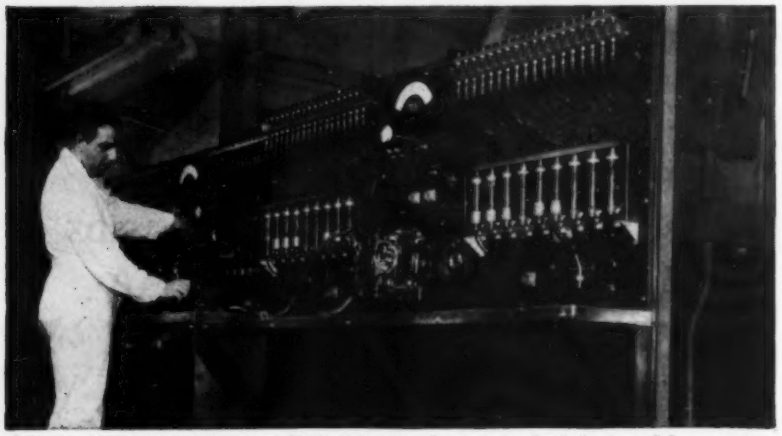



GREER PROPELLER GOVERNOR TEST STAND checks the mechanical "IQ" of the brains behind the performance of hydromatic constant speed propellers. This machine will test double acting, single or double capacity and reversible governors.



GREER HI-LO MAGNETO TEST STAND, above, tests both high and low tension magnetos, distributors, and coils of Pratt & Whitney and Wright Aircraft engines.

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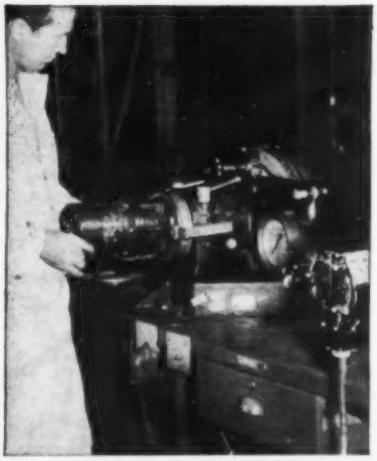

GREER AIRCRAFT STARTER TESTER is used for high capacity aircraft starters up to 1400 foot-pounds of torque. Accessories kit permits testing of actuators.

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**Lake Central Airlines, Inc.,** Weir Cook Municipal Airport, Indianapolis 44, Ind.
*Equipment:* 7 DC-3's; 1 C-46
*Total Employees:* 285
*Pilots Employed:* 50

**Los Angeles Airways, Inc.,** 5901 W. Imperial Highway, Los Angeles 45, California
*Equipment:* 3 Sikorsky S-51's; 2 Sikorsky S-55's; *On Order:* 1 S-55

**Mackey Air Transport, Inc.,** P. O. Box 6867, Palm Beach Int'l Airport, West Palm Beach, Fla.
*Equipment:* DC-3's

**Midet Aviation Corp.,** Palm Beach Int'l Airport, West Palm Beach, Florida

**Mohawk Airlines, Inc.** (Formerly Robinson Airlines Corp.), Cornell University Airport, Ithaca, New York
*Equipment:* 9 DC-3's

**National Airlines, Inc.,** Aviation Building, 3240 N. W. 27th Ave., Miami 42, Florida
*Equipment:* 11 Lockheed Lodestars; 3 DC-4's; 7 DC-6's; 8 DC-6B's; *On Order:* 8 Convair 340's; 2 DC-6B's; 4 DC-7's
*Total Employees:* 2,830

**New York Airways, Inc.,** P. O. Box 426, New York Airport Station, Flushing 71, N. Y.
*Equipment:* 3 Sikorsky S-55's; *On Order:* 4 S-55's

**North Central Airlines, Inc.** (Formerly Wisconsin Central), 3300 University Ave., S. E., Minneapolis, Minnesota
*Equipment:* 10 DC-3's
*Total Employees:* 495

**Northeast Airlines, Inc.,** Logan Int'l Airport, 239 Prescott St., E. Boston 28, Mass.
*Equipment:* 4 Convair 240's; 9 DC-3's
*Total Employees:* 774
*Pilots Employed:* 84

**Northwest Airlines, Inc.,** 1885 University Ave., St. Paul, Minn.
*Equipment:* 10 Boeing Stratocruisers; 24 DC-4's; 8 DC-3's
*On Order:* 6 L-1049C's
*Total Employees:* 5,696
*Pilots Employed:* 402

**Ozark Air Lines, Inc.,** Box 6, Lambert Field, St. Louis 21, Missouri
*Equipment:* 9 DC-3's
*Total Employees:* 352

**Pan American World Airways, Inc.,** 135 East 42nd Street, New York 17, N. Y.
*Atlantic Division:* 28-19 Bridge Plaza North, Long Island City 1, N. Y.
*Equipment:* 13 Boeing Stratocruisers; 8 DC-4's; 18 DC-6B's
*Pilots Employed:* Captains: 220; Co-pilots: 460
*Latin American Division:* Miami International Airport, Miami, Fla.
*Equipment:* 13 Boeing Stratocruisers; 8 DC-4's; 18 DC-6B's
*Pilots Employed:* Captains: 220; Co-pilots: 460
*Pacific-Alaska Division:* San Francisco Airport, P. O. Box 151, So. San Francisco, Calif.
*Equipment:* 15 Stratocruisers; 15 DC-4's
*On Order* (all divisions): 3 DC-6A's; 25 DC-6B's
*Pilots Employed:* Captains: 102; Co-pilots 211

**Pan American-Grace Airways, Inc.,** 135 East 42nd Street, New York 17, N. Y.
*Total Employees:* 1,557
*Equipment on order:* 2 DC-6B's

**Piedmont Airlines,** Smith Reynolds Airport, Winston-Salem, North Carolina
*Equipment:* 12 DC-3's
*Total Employees:* 541
*Pilots Employed:* 77

**Pioneer Air Lines, Inc.,** Love Field, Dallas, Texas
*Equipment:* 9 Martin 2-0-2's
*Total Employees:* 435
*Pilots Employed:* 58

**Resort Airlines, Inc.,** P. O. Box 242, Int'l Airport, Miami 48, Fla.

**Riddle Airlines, Inc.,** Int'l Airport, Miami, Fla. (Mail: P. O. Box 4632, Coral Gables, Fla.)

**Slick Airways, Inc.,** 3000 N. Clybourn Ave., Burbank, Calif.
*Equipment:* 5 DC-6A's; 23 C-46's

**Southern Airways, Inc.,** General Offices: Municipal Airport, Birmingham, Ala.; Traffic, sales and operations office: Municipal Airport, Atlanta, Ga.
*Equipment:* 10 DC-3's
*Total Employees:* 467
*Pilots Employed:* 65

**Southwest Airways Co.,** San Francisco Airport, So. San Francisco, Calif. Mail: P. O. Box 268, So. San Francisco, Calif.
*Equipment:* Martin 202's; DC-3's
*Total Employees:* 350
*Pilots Employed:* 57

**Trans World Airlines, Inc.**, 10 Richards Road, Kansas City 6, Mo.
*Equipment:* 10 Super Constellations; 68 Constellations; 40 Martin 4-0-4's; 12 Martin 2-0-2's; 13 DC-4's; 28 DC-3's
*Total Employees:* 14,648
*Pilots Employed:* 976

**Trans-Pacific Airlines, Ltd.** (The Aloha Airline), P. O. Box 2113, Honolulu, T. H.
*Equipment:* 5 DC-3's

**Trans-Texas Airways**, Municipal Airport, Houston, Texas
*Equipment:* 10 DC-3's
*Total Employees:* 372

**United Air Lines, Inc.**, Executive Offices: 5959 S. Cicero Ave., Chicago 38, Ill.; Operating Base: Stapleton Field, Denver, Colo.
*Equipment:* 53 DC-3's; 23 DC-4's; 43 DC-6's; 19 DC-6B's; 6 Stratocruisers; 20 Convair 340's; *On Order:* 14 Convair 340's; 2 DC-6B's; 25 DC-7's
*Total Employees:* 13,793

**U. S. Airlines, Inc.**, 500 Fifth Ave., New York 36, N. Y.
*Equipment:* 7 C-46's
*Total Employees:* 72
*Pilots Employed:* 38

**Uraba, Medellin & Central Airways, Inc.**, 135 E. 42nd St., New York

**West Coast Airlines, Inc.**, Boeing Field, Seattle 8, Washington
*Equipment:* 12 DC-3's
*Total Employees:* 389
*Pilots Employed:* 69

**Western Air Lines, Inc.**, 6060 Avion Drive, P. O. Box 10,005 Airport Station, Los Angeles 45, Calif.
*Equipment:* 10 DC-3's; 5 DC-4's; 10 Convair-Liners; 5 DC-6B's; *On Order:* 3 DC-6B's
*Total Employees:* 1,650

**E. W. Wiggins Airways, Inc.**, Norwood Municipal Airport, Norwood, Mass.
*Equipment:* 6 Cessna T-50's
*Total Employees:* 63

**Wisconsin Central Airlines, Inc.**, 3300 University Ave., S. E., Minneapolis, Minn.
*Equipment:* 6 DC-3's

## ALASKA

**Alaska Airlines, Inc.**, General Offices: 2320 Sixth Ave., Seattle, Wash.
*Equipment:* DC-4's; DC-3's; C-46's, single-engine ski and float equipment. Total: 50 planes

**Alaska Coastal Airlines**, P. O. Box 2808, Juneau, Alaska
*Equipment:* 1 Catalina; 6 Grumman G-21A's; 2 Grumman G-44's; 1 Lockheed Vega; 1 Bellanca; 1 Republic Seabee

**Bristol Bay Airlines**, Dillingham, Alaska
*Equipment:* 2 Stinson Station Wagons; 2 Bellanca Sky Rockets; 1 Twin Cessna

**Byers Airways, Inc.**, Box 1410, Fairbanks, Alaska
*Equipment:* 1 Twin Cessna; 1 AT-19 Stinson; 1 Howard GH-2; 1 Cessna 170; 1 Piper Pacer on floats

**Christensen Air Service**, Anchorage, Alaska
*Equipment:* 1 Waco Aristocrat, 1 J4F2 Grumman Widgeon

**Cordova Airlines**, P. O. Box 1499, Anchorage, Alaska
*Equipment:* 1 Douglas DC-3; 1 Grumman Goose G-21; 3 Cessna 170's; 2 Piper PA-14's; 1 V-77 Stinson; 1 Jr.-Sr. Stinson; 1 SR9 Stinson

**Ellis Air Lines**, Box 1059, Ketchikan, Alaska
*Equipment:* 3 Aeronca Sedans (Seaplanes); 2 Grummans (Amphibians)

**Munz Airways**, P. O. Box 639, Nome, Alaska
*Equipment:* 3 Stinsons; 2 Howards

**Northern Consolidated Airlines, Inc.**, 414 Fourth Ave., Anchorage, Alaska
*Equipment:* 4 DC-3's; 1 PBY5A; 5 Norseman; 17 Cessna T-50's; 5 Stinson Reliants; 1 Seabee

**Pacific Northern Airlines, Inc.**, Anchorage, Alaska (Mail: 1626 Exchange Bldg., Seattle 4, Wash.)
*Equipment:* DC-3's & DC-4's

**Reeve Aleutian Airways, Inc.**, 420 D. Street, Box 559, Anchorage, Alaska
*Equipment:* 3 DC-3's; 2 Sikorsky S-43's; 1 Grumman Goose; 2 Fairchild 71's; 1 Boeing 80-A
(Scheduled passenger & cargo service serving the Alaska Peninsula, The Aleutians & Pribilof Islands)

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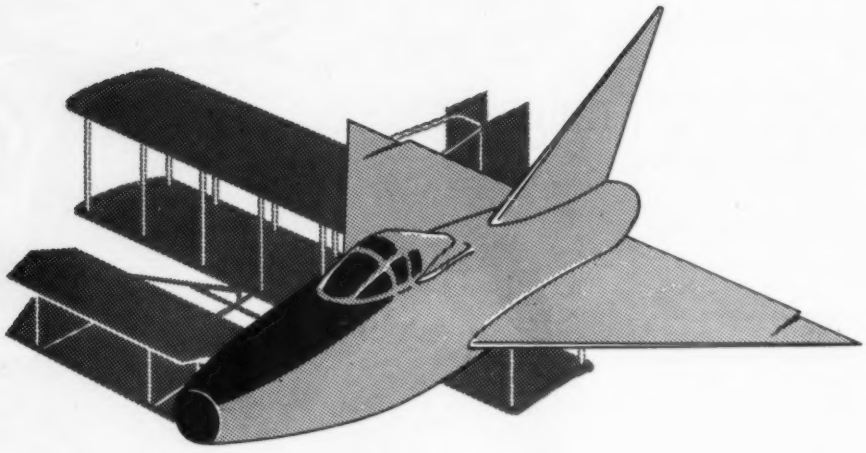

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**Safeway Airways**, Merrill Field, Anchorage, Alaska
*Equipment:* Grumman Widgeon; Three Stinson Station Wagons; Piper Pacer and Piper Cub

**Wien Alaska Airlines, Inc.**, Box 649, Fairbanks, Alaska
*Equipment:* 2 C-46's; 3 DC-3's; 6 Noorduyn's; 3 Cessna 195's; 8 Cessna 170's
*Total Employees:* 130
*Pilots Employed:* 24

## CANADA

**Associated Air Taxi Ltd.** (Associated), Vancouver, AMF, B. C.
*Equipment:* 12 seaplanes
*Total Employees:* 57
*Pilots Employed:* 14

**Canadian Pacific Airlines, Limited**, Head Office: Vancouver, AMF, B. C.
*Equipment:* DC-3's; Canso A's; DC-4's; DH Comet; DC-6B's; Convair 240's; *On Order:* 2 DC-6A's; 3 DC-6B's
*Total Employees:* 1,305
*Pilots Employed:* 136

**Central Northern Airways, Ltd.**, Head Office: Stevenson Airport, Winnipeg
*Equipment:* 11 Norsemen; 2 Ansons; 1 Beaver; 1 Bellanca; 1 Lockheed; 1 Stinson

**Leavens Bros. Air Services Ltd.**, Head Office: Barker Airport, Toronto, Ont.
*Equipment:* 31 single-engine aircraft; 5 twin-engine aircraft

**Maritime Central Airways, Ltd.**, Charlottetown, P. E. Island
*Equipment:* 3 Lockheed 10's; 2 Anson Mark V's; 3 Cansos; 9 DC-3's; 1 DH Beaver

**Mont Laurier Aviation Co., Ltd.**, Saint Jean de Brebeuf, Roberval Co., P. Q.
*Equipment:* 3 Norsemen VI's; 1 Canso Amphibian and 1 Fox Moth
(Scheduled & charter cargo & passenger service)

**Queen Charlotte Airlines, Ltd.**, Vancouver AMF., B. C.
*Equipment:* 2 Stranraer Flying Boats; 2 Canso Amphibians; 7 Avro Ansons; 8 Norsemen (floats); 1 Stinson (float); 1 Fairchild Husky (float); 1 Beech D-17S (float)
*Total Employees:* 220

**Rimouski Airlines, Ltd.**, Rimouski, P. Q.
(Scheduled and charter service)

**Saskatchewan Government Airways**, P. O. Box 850, Prince Albert, Sask.
*Equipment:* 1 Canso; 4 Ansons; 5 Norsemen; 3 Beavers; 3 Stinsons; 4 Cessna 140's
*Total Employees:* 70
(Non-scheduled passenger & cargo service)

**Trans-Canada Air Lines**, Executive Offices: Int'l Aviation Bldg., 1080 University St., Montreal, P. Q.
*Total Employees:* 6,551
*Pilots Employed:* Captains: 193; First Officers: 194
*Equipment:* Canadair North Stars and DC-3's; *On Order:* 5 L-1049C's
*On Order:* 8 Lockheed Super Constellations; 13 Vickers Viscounts; 3 Bristol Freighters

**Wheeler Air Lines, Ltd.**, St. Jovite, Quebec
*Equipment:* 1 Anson Mk-V; 3 Norsemen; 1 Beaver; 1 Cessna 195; 1 Canso

# Europe

## BELGIUM

**Sobelair (Societe Belge De Transports Par Air, S. A.)**, 137, Rue, Royale, Brussels
*Equipment:* 5 DC-3's
*Total Employees:* 72
*Pilots Employed:* 12
(Non-scheduled passenger and cargo service)

**Societe Anonyme Belge d'Exploitation de la Navigation Aerienne** (Sabena)
*Equipment:* 6 Convair 240's; 5 DC-6's; 7 DC-4's; 23 DC-3's; 6 DH Doves; 8 Locksheeds; 3 Ju52's; 3 Bell 47-DI helicopters; 4 S-51 Sikorsky helicopters; 3 Piper Cubs; 2 Tiger Moths; 1 Auster V
*On Order:* 8 DC-6B's; 2 DC-6A's

## BULGARIA

**Bulgarian-Soviet Joint Stock Co. for Civil Aviation (TABSO)**, 12 Place Narodno, Sabranie, Sofia
*Equipment:* Li-2's

## CYPRUS

**Cyprus Airways, Ltd.**, 18 Homer Ave., Nicosia
*Equipment:* 6 DC-3's
*Total Employees:* 208
*Pilots Employed:* 19


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Special formulae used in compounding rubber for JOY plugs and cable assemblies, keep them pliable enough to handle even in sub-zero temperatures. Insulation will not stiffen enough to crack when flexed at −67° Fahrenheit.

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## CZECHOSLAVAKIA

**Ceskoslovenske Aerolinie (Czechoslovakian Air Lines),** 1 Namesti Republiky, Prague
*Equipment:* DC-3's and Flyushin Il-12's

## DENMARK

**Det Danske Luftfartselskab A/S (DDL) (Danish Air Lines),** Kobenhavns Lufthavn, Kastrup (See Scandinavian Airlines System)

## FINLAND

**Aero O/Y (Finish Air Lines),** Mannerheimintie 9B, Helsinki
*Equipment:* DC-3's and Convair 340's; *On Order:* 2 Convair 340's

**Veljekset Karhumaki O/Y,** Head Office: Halli
*Equipment:* Airspeed Oxfords & Lockheed Lodestars

## FRANCE

**Aigle Azur,** 70, Avenue des Champs, Elysees, Paris 8e
*Equipment:* 5 Boeing 307's; 12 DC-3's; 8 Airspeed Consul; 6 Dragon Rapide
*Total Employees:* 475

**Compagnie Air Transport (C.A.T.),** 5, Avenue Hoche, Paris (8e)
*Equipment:* Languedoc & 3 DC-4's

**Campagnie de Transports Aeriens Intercontinentaux (TAI),** 23 rue de la Paix, Paris 2°
*Equipment:* 4 DC-4's; 4 SE 2010 Armagnacs; 3 DC-6B's; *On Order:* 3 DC-6B's

**Compagnie Nationale Air France,** 2 rue Marbeuf, Paris Villeme
*Equipment:* 23 Lockheed 749A's; 27 DC-4's & C-54's; 14 Languedocs; 35 DC-3's
*On Order:* 10 Super Constellations; 12 Breguet 763's; 3 Comets; 12 Vickers Viscounts
*Total Employees:* 14,866

**Union Aeromaritime de Transport (UAT),** 19, boulevard Malesherbes, Paris 8e
*Equipment:* 5 DC-4's; 3 DC-3's; 3 Comet I's; 3 Herons

## GIBRALTAR

**Gibraltar Airways Ltd. (GIBAIR),** Cloister Bldg., Box 212, Irish Town
*Equipment:* 3 DH Rapides

## GREAT BRITAIN

**Air Commerce, Ltd.,** Main Hall, Terminal Bldg., Croydon Airport, Surrey
*Equipment:* 3 DH Doves; 3 DH Rapides; 2 Consuls; 1 Proctor

**Air Kruise (Kent) Ltd.** (Trans Channel Airways), Lympne Airport, Hythe, Kent
*Equipment:* DH Rapides; DH Doves
*Total Employes:* 40
*Pilots Employed:* 6

**Air Transport (Charter) (C.I.), Ltd.,** 20-22, High St., Camberley, Surrey
*Equipment:* 3 DC-3's; 3 DH Rapides

**Airwork Ltd.,** 15 Chesterfield St., London, W. I.
*Equipment:* 4 Hermes; 7 Vikings; 3 Bristol Freighters; 1 DC-3; 10 DH Doves; 11 DH Rapides & miscellaneous equipment

**Aquila Airways, Ltd.,** 6 Curzon Pl., Park Lane, London, W. I.
*Equipment:* 5 Short Sandringhams; 1 Short Solents
(Scheduled & non-scheduled passenger & cargo service)

**British European Airways,** Head Office: Keyline House Northholt, Middlesex; London Office: Dorland House, Lower Regent St., W. I.
*Equipment:* 48 Vickers Vikings; 48 DC-3's; 20 Airspeed Ambassadors; 2 Dart-Dakotas; 15 DH 89 Rapides; 6 helicopters
*On Order:* 26 Vickers Viscount 701's (deliveries pending); 12 Vickers Viscount 801's

**British Overseas Airways Corp. (BOAC),** Airways House, Great West Road, Brentford, Middlesex
*Equipment:* 22 Canadairs, 10 Stratocruisers; 20 Constellations; 19 Hermes; 7 Yorks; 9 Comet I's
*On Order:* 11 Comet II's; 26 Bristol Britannias; 2 Constellations

**Cambrian Air Services, Ltd.,** Pengam Moors Airport, Cardiff, Glam., So. Wales
(Daily services: Cardiff-Liverpool, Channel Islands, Weston-super-Mare)
*Equipment:* D. H. Rapides

**Fairflight, Ltd.,** 15, Great Cumberland Pl., London, W. I.

**Hunting Air Transport Ltd.,** 5, Fitzhardinge St., Portman Square, London, W.I.
*Equipment:* 8 Vikings; 1 DC-3

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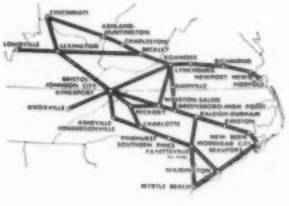

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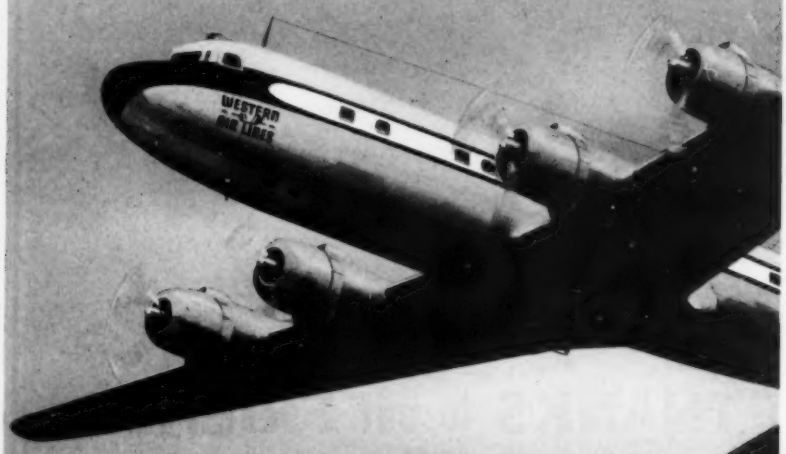


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**Jersey Airlines,** 4, The Parade, Jersey Channel Islands
*Equipment:* 6 DH 89A's; 1 DH Heron

**Lancashire Aircraft Corp.** (Operating as Skyways of London), 7 Berkeley St., London, W. I.
*Equipment:* 29 Yorks; 5 Haltons; 13 Rapides; 5 Consuls; 11 Proctors; 5 Austers; 1 Aerovan; 1 Handley Page Halifax
*Total Employes:* 672
(Passenger & freight charter)

**Merchant Airways, Ltd.,** Grand Arcade, Grand Bldgs., Trafalgar Square, London, W. C. 2
(Contract charter in the Middle East & Africa using 2 Airspeed Consuls & 1 DC-3)

**Morton Air Services Ltd.,** Croydon Airport, Surrey; Whitechurch Airport, Bristol
*Equipment:* 3 Doves; 3 Consuls; 2 Rapides
(Passenger, ambulance, freight charter & scheduled services)

**Olley Air Service Ltd.,** Main Hall, Croydon Airport, Croydon, Surrey
*Equipment:* 3 DH Doves; 3 DH Rapides; 2 Airspeed Consuls; 1 Proctor
*Total Employes:* 50
(Scheduled & non-scheduled passenger & cargo service)

**Scottish Airlines,** Prestwick Airport, Ayrshire, Scotland
*Equipment:* 3 Yorks; 3 DC-3's; 1 Rapide; 1 Consul
(Scheduled passenger & charter services)

**Silver City Airways, Ltd.,** 1 Great Cumberland Pl., London, W. I.
*Equipment:* 9 Bristol Freighters
*On Order:* 6 Bristol Freighters
(Contract freight & passenger operator)

**Skyways Ltd.,** 6 & 7 Berkeley St., London, W. I.

**Trans World Charter, Ltd.,** 34, Upper Brook St., London, W. I.
*Equipment:* 4 Vikings

## GREECE

**TAE National Greek Airlines** (Technical & Aeronautical Exploitations Co. Ltd.), 12, Merlin St., Athens
*Equipment:* 1 DC-4 and 18 DC-3's

## HUNGARY

**Magyar-Szovjet Legiforgalmi Tarsasag** (Maszovlet), 7 Dorottya, Utca Budapest
*Equipment:* Li-2's

## ICELAND

**Flugfelag Islands, H. F.** (Iceland Airways, Ltd.), Laekjargata 4, Reykjavik
*Equipment:* 3 DC's; 1 DC-4; 3 PBY5's; 1 Grumman JRF-5; 1 DH 89A Rapide, 1 Norduyn Norseman
*Total Employes:* 105
*Pilots Employed:* 14

**Loftleidir The Icelandic Airlines,** P. O. Box 476, Laekjargata 2, Reykjavik
*Equipment:* 1 Avro Anson Mark V; 1 DC-4; 3 Grumman Goose 21A's; 1 UC-64; 1 Stinson Reliant; 1 C-47; 2 PBY-5's

## IRELAND

**Aer Lingus TTA (ALT),** 43 Upper O'Connell St., Dublin
*Equipment:* 13 DC-3's; 4 Bristol 170's
*On Order:* 4 Vickers Viscounts

**Aerlinte Eirann TTA,** 43 Upper O'Connell Street, Dublin
(Will start trans-Atlantic operations in 1954 using Super Constellations chartered from Seaboard and Western Airlines)

**Aer Rianta TTA (ART),** 43, Upper O'Connell St., Dublin

## ITALY

**Aerolinee Italiane Internazionali** (Alitalia) via Leonida Bissolati, 20 Rome
*Equipment:* 4 DC4's
*On Order:* 4 DC-6B's and 3 Convair 340's
*Total Employes:* 333
*Pilots Employed:* 84
(Scheduled passenger & cargo service)

**LAI-Linee Aeree Italiane,** Via del Tritone, 132, Rome
*Equipment:* 24 DC-3's; 3 DC-6's
*On Order:* 3 DC-6B's and 4 Convair 240's
*Total Employees:* 623

## MALTA

**The Malta Airlines,** Phoenica Hotel, The Mall, Valletta (uses equipment chartered from British European Airways)

## NETHERLANDS

**Koninklijke Luchtvaart Maatschappij N. V. (K. L. M. Royal Dutch Airlines),** Badhuisweg 260, P. O. Box 121, The Hague

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*Equipment:* 1 Auster V; 1 DH-89A; 12 Convair 240's; 20 DC-3's; 10 DC-4's; 6 DC-6's; 7 DC-6B's; 15 Constellations.
*On Order:* 12 Convair 340's; 2 DC-6A's; 13 Super Constellations
*Total Employes:* 12,835
*Pilots Employed:* 409

**N. V. Vliegbedrijf "Meteor,"** Keizersgracht 414, Amsterdam-C
*Equipment:* 6 Auster V's

## NORWAY

**Braathens South-American & Far East Airtransport A/S (S.A.F.E.),** Fr. Nansens plass 7, Oslo
*Equipment:* 1 DC-4; 1 DC-3; 2 DH Herons
*On Order:* 2 L-1049C Super Constellations
*Total Employes:* 212
*Pilots Employed:* 20

**Det Norske Luftfartselskap A/S (DNL) (Norwegian Air Lines),** Fornebu Airport, Oslo (See Scandinavian Airlines System)

**Fred Olsen Flyselskap A/S,** Fred Olsens Gate 2, Oslo
*Equipment:* 1 DC-4; 2 DC-3's

## POLAND

**Polskie Linie Lotnicze "LOT" (Polish Airlines "LOT"),** Lot Bldg., rue Hoza 39, Warsaw
*Equipment:* IL-12; Li-2

## PORTUGAL

**Aero Portuguesa, Lda. (AP),** Avenida da Liberdade, 120 Lisbon
*Equipment:* 1 DC-3 and 1 Lodestar

**Transportes Aereos Portugueses (TAP),** 2 Rua Braamcamp, Lisbon
*Equipment:* 3 DC-4's; 6 DC-3's; 1 Beechcraft
*Total Employees:* 437

## ROMANIA

**Transporturi Aeriene Romana Sovietica (TARS),** 11 Strada Nicolae Iorga, Bucharest
*Equipment:* IL-12's and Li-2's

## SPAIN

**Aviacion y Comercio S. A.,** 33 Calle Aduana, Madrid
*Equipment:* Bristol Freighters; SNCASE 161 Languedoc

**Iberia (Lineas Aereas Espanolas),** Plaza de Canovas del Castillo 4, Madrid
*Equipment:* DC-4's and DC-3's
*On Order:* 3 Super Constellations; L-1049C's

## SWEDEN

**Aktiebolaget Aerotransport (ABA) (Swedish Air Lines),** Bromma Airport, Stockholm 40 (See Scandinavian Airlines System)

**AB Nordisk Aerotjanst** (Nordaero), Kungsangens Flygplats, Norrkoping
(Non-scheduled passenger & cargo service, flying school & overhaul)
*Equipment:* Lodestars

**Scandinavian Airlines System,** Denmark, Norway & Sweden, Head Office: Bromma Airport, Stockholm 40
*Equipment:* 2 DC-6B's; 12 DC-6's; 9 DC-4's; 6 SAAB Scandias; 21 DC-3's; 2 Sandringhams; 2 Junkers 52's
*On Order:* 12 DC-6B's
*Total Employees:* 7,700

**Svensk Flygtjanst A. B.** (Swedish Air Service Ltd.), Arsenalsgatan 4, Stockholm
*Equipment:* 1 Bucker Jungman; 10 Saab 17's; 11 Fairey Fireflies

## SWITZERLAND

**Swissair (Swiss Air Transport Co., Ltd.),** Hirschengraben 84, P. O. Box 929, Zurich
*Equipment:* 4 Convair 240's; 3 DC-6B's; 13 DC-3's; 3 DC-4's; 3 DH 89's
*On Order:* 3 DC-6B's
*Total Company Employees:* 2,104

## UNION OF SOVIET SOCIALIST REPUBLICS

**Civil Air Fleet Administration (Aeroflot),** Moscow
*Equipment:* IL-12's; Li-2's and miscellaneous types

**Sino-Soviet Aviation Corporation (Hamiata),** Urumchi
*Equipment:* Li-2's

## YUGOSLAVIA

**Jugoslovenski Aerotransport (JAT),** Birjanivova 1/111, Belgrade
*Equipment:* 21 DC-3's; *On Order:* 3 Convair 340's
*Total Employees:* 600


# How Alternator *BURN-OUTS* can be *Eliminated* with New Alarm System

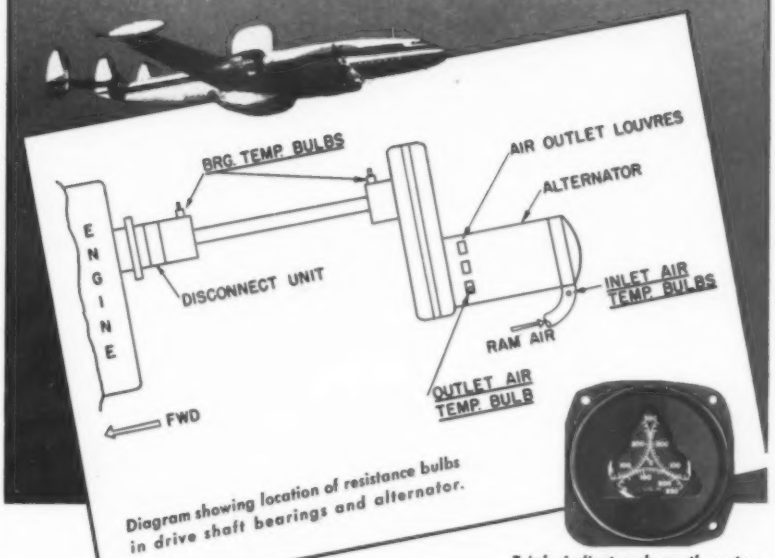


Diagram showing location of resistance bulbs in drive shaft bearings and alternator.

*Triple indicator shows three temperature readings on single dial.*

**Lockheed and Edison engineers** jointly developed this new Temperature Alarm System to eliminate burn-outs and bearing failures in the high speed alternator drive system of the RC-121C and WV-2 aircraft. After alarm the entire alternator drive system can be immediately disconnected.

**This new Alarm System** utilizes the same type of EDISON components which already have given years of dependable service in aircraft throughout the world. Standard tip-sensitive electrical resistance bulbs are placed in the drive shaft and gear box bearings to detect an early temperature rise which might lead to a bearing failure. The sensitive part of the bulb penetrates the housing and actually bears directly against the bearing race so that the slightest temperature increase is felt immediately and indicated on the left and right-hand scales respectively of the triple panel indicator.

**Because** of critical space limitations in the alternator itself it was decided to measure the differential temperature across the inlet and outlet air passages. Two bulbs in the inlet air duct are compared to a single bulb in the outlet air louvres and the differential temperature is indicated on the bottom scale of the panel indicator. The primary purpose of this arrangement is to detect a temperature rise due to mechanical failure with the added advantage of detecting electrical overloads. This added safety feature presents the possibility of preventing complete shut-down by reducing the alternator load.

**An integral** automatic alarm circuit completes the system so that the crew is alerted by visual warning well in advance of any danger from critical temperatures.

Thomas A Edison
INCORPORATED
*Instrument Division*
Dept. 94, West Orange, New Jersey

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VHF COMMUNICATIONS RECEIVER
SPACE ECONOMY!
SAVE MORE THAN 40% RACK SPACE! A standard 66" rack will hold only 7 ordinary VHF receivers. 12 SCHUTTIG S220A receivers will fit in this same rack! The SCHUTTIG receiver requires only 5¼ inches of vertical rack space as contrasted with 8¾ inches for other VHF receivers. The S220A is competitive in price, too!
SELECTIVITY: Bandwith is ±20 Kc 6 db down; ±100 Kc 60 db down.
SENSITIVITY: 1 MICROVOLT modulated 30% provides 1 watt with 10 db S/N ratio!
OUTPUT: 3 WATTS; feeds either built-in speaker or 600 ohm line.
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TRANS-TEXAS Airways


## Central & South America

### ARGENTINA

**Aerolineas Argentinas,** Paseo Colon 185, Buenos Aires
*Equipment:* 6 DC-6's; 6 DC-4's; 20 DC-3's; 5 Convairs; 6 Sandringhams (flying boats)
*Total Employees:* 4,646
*Pilots Employed:* 153

**Aerovias Rutas Aereas Mercantes Argentinas,** 560 Avenida de Mayo, Buenos Aires
*Equipment:* Lockheed Lodestars; DH Dragon Rapides

**Compania De Aviacion Pan American Argentina,** Av. Pte. Roque Saenz, Pena 788, Buenos Aires
(Not an Operating Company)

**Lineas Aereas Del Estado (LADE),** Corrientes 480, Buenos Aires
*Equipment:* DC-3's & Vickers Vikings

### BAHAMA ISLANDS

**Bahamas Airways, Ltd. (BAL),** Oakes Airfield, Nassau
*Equipment:* 1 Catalina; 3 Goose; 1 Widgeon

### BOLIVIA

**Lloyd Aereo Boliviano S. A. (LAB),** Casilla 132, Cochabamba
*Equipment:* 11 DC-3's; 4 B-17's

### BRAZIL

**Aero Geral Ltda. (AEROGERAL),** 194 Ave. Franklin Roosevelt, Rio de Janeiro
*Equipment:* 2 C-46's; 3 DC-3's

**Companhia Itau De Transportes Aereos,** Rua Asdrubal do Nascimento 436, Sao Paulo
*Equipment:* 9 C-46's
*Total Employees:* 385
*Pilots Employed:* 28

**Empresa De Transportes Aereos Norte Do Brasil Ltda (AERONORTE),** Avenida Pedro 11, 58-D, Sao Luiz, Maranhao

**Empresa De Transportes Aereovias Brasil, S. A. (Brazilian International Airlines),** Av. Ipiranga, 1248, Sao Paulo
*Equipment:* 21 DC-3's; 3 DC-4's; 5 C-46's
*Total Employees:* 1,600
*Pilots Employed:* 200

**Loide Aereo Nacional S/A (LOIDE),** Avenida 13 de Maio, 13-27° andar, Rio de Janeiro

**Panair Do Brasil, S. A.,** Edificio Panair, Aeroporto Santos-Dumont, Caixa Postal 694, Rio de Janeiro
*Equipment:* 6 Constellations, 5 PBY-5A's; 17 DC-3's
*On Order:* 4 Comet II's
*Total Employees:* 3,850
*Pilots Employed:* 213

**Real S/A—Transportes Aereos,** Rua Conselheiro, Crispiniano, 379-8° andar, Sao Paulo
*Equipment:* 28 DC-3's; 4 C-46's
*On Order:* 4 Convair 340's
*Total Employees:* 1,300
(Passenger & cargo)

**S. A. Empresa de Viacao Aerea Rio Grandense (Varig),** Avenida Borges de Medeiros 453, Porto Alegre
*Equipment:* 2 Lockheed Electras; 22 DC-3's; 13 Curtiss C-46's
*On Order:* 10 Curtiss C-46's; 3 L-1049C's

**Servicos Aereos Cruzeiro Do Sul, Ltda, (Cruzeiro),** Avenida Rio Branco, 128, P. O. Box 190, Rio de Janeiro
*Equipment:* 38 DC-3's; 6 AT-11's
*On Order:* 4 Convair 340's
*Total Employees:* 2,930
*Pilots Employed:* 140

**Sociedade Anonima Viacao Aerea Gaucha (SAVAG),** Edificio Camara do Comercio, Rio Grande
*Equipment:* 6 Lockheed Lodestars

**Transportes Aereos Catarinense S/A (T. A. C.),** Felipe Schmidt, 14 Florianopolis, Santa Catarina
*Equipment:* DC-3's
*On Order:* 3 DC-3's

**Transportes Aereos Nacional Ltda,** Av. General Justo 275, anexo 13, 7° andar, Rio de Janeiro

**Transportes Aereos Salvador Ltda., (T. A. S.),** Av. Joana Angelica, 8 Salvador, Bahia
*Equipment:* 4 Beechcraft Bonanzas A-35's; 2 DH Herons
*On Order:* 1 DH Heron
*Total Employees:* 55
*Pilots Employed:* 8

**Viacao Aerea Brasil S/A (VIABRAS),** Av. General Justo 275, anexo 13, 7° andar, Rio de Janeiro

**Viacao Aerea Santos Dumont, S. A. (VASD),** Ave. Franklin Roosevelt 137, Rio de Janeiro
*Equipment:* 2 DC-3's

# EXPANDING!

## New Routes... New Equipment for LAV

One of the successful pioneers of commercial aviation in the Americas, LAV has extensive routes within the Republic of Venezuela and, at present, links **VENEZUELA** with the **UNITED STATES, CUBA, PERU, PANAMA, TRINIDAD, BARBADOS, CURACAO** and **ARUBA.** Recent arrangements provide for an expansion of service from Venezuela to such European capitals as **LISBON, MADRID, PARIS** and **ROME.**

Of paramount importance to LAV's continuous program of growth is the utilization of the most advanced equipment. The airline is now awaiting delivery of four great new passenger planes — two De Haviland "Comet" Jets and two Lockheed Super-Constellations —for service on new routes and on its famous non-stop run between New York and Caracas. The only airline operating non-stop between these two points, LAV makes the flights in 7½ hours via modern Constellations with complete first-class service and comfort.

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*Our Many Friends and Customers*

*in Our*

25th ANNIVERSARY YEAR

TULSA MUNICIPAL AIRPORT
Charles W. Short, Manager

**Viacao Aerea Sao Paulo, S/A (VASP)**, Rua Libero Badaro, 89 Sao Paulo
*Equipment:* 20 DC-3's; 6 Scandias
*On Order:* 4 Scandias

## BRITISH GUIANA

**British Guiana Airways, Ltd.**, 32 Main St., Georgetown
*Equipment:* "Irelands," Grumman G-21's and DC-3's

## CHILE

**Linea Aerea Nacional De Chile (LAN)**, Los Cerrillos, Santiago
*Equipment:* 4 Lodestars; 3 Electras; 8 DC-3's; 4 Martin 202's; 12 DH Doves; and 1 Bononza

## COLOMBIA

**Aerovias Nacionales de Colombia (Avianca)**, Parque de Santander, Bogota
*Equipment:* 8 DC-4's; 28 DC-3's; 1 PBY-5A; 5 C-46's; 2 Constellations
*On Order:* 3 Super Constellations

**Aviacion, Refrigeracion y Pesca (Afrypesca)**, Avenida Jimenez 11-28, Bogota

**Lineas Aereas Nacionales Consolidadas S. A. (LANSA)**, Calle 34, No. 40-53, Barranquilla
*Equipment:* 16 DC-3's
*Total Employees:* 513
*Pilots Employed:* 67

**Lineas Aereas Trasatlanticas Colombianas Ltda. (LATCO)**, Carrera 44, No. 35-27, Barranquilla
*Equipment:* 4 C-46's
*Total Employees:* 66
*Pilots Employed:* 8

**Lineas Interamericanas Aereas, S. A. (LIA)**, Av. Jimenez, No. 8-60, Bogota
*Equipment:* 3 C-46's
*Total Employees:* 106
*Pilots Employed:* 12
(Cargo & passenger)

**Sociedad Aerea del Tolima, S. A. (SAETA)**, Calle 19 No. 6-39—6-41, Bogota
*Equipment:* 5 DC-3's

**Sociedad Aeronautica Medellin S. A. (SAM)**, Avenida lo de Mayo 49-100, Apartado Aereo 1085, Medellin
*Equipment:* 5 C-46's; 3 DC-3's
*Total Employees:* 295
*Pilots Employed:* 22
(Cargo only)

**Sociedad Occidental De Transportes Aereos (Sota Ltda)**, Calle 9a No. 3-85, Cali
*Equipment:* C-46's
(Passenger & cargo

**Taxi Aereo de Santander (Taxader)**, Apartado Postal No. 688, Bucaramanga, Santander
*Equipment:* 1 Stinson; 4 Beavers
*On Order:* 1 Beaver
*Total Employees:* 25
*Pilots Employed:* 4
(Cargo)

## COSTA RICA

**Lineas Aereas Costarricenses, S. A. (Lacsa)**, Avenida la. No. 39 E., Box 1531, San Jose
*Equipment:* 4 DC-3's; 4 C-46's
*Total Employes:* 155
*Pilots Employed:* 36

## CUBA

**Aerovias "Q," S. A.**, Cienfuegos 72, Havana
*Equipment:* 6 DC-3's; 2 Connestogas
*On Order:* 2 DC-4's

**Compania Cubana De Aviacion, S. A. (Cubana)**, 23 No. 105, Vedado, Havana
*Equipment:* 6 DC-3's; 2 DC-4's

**Cuba Aeropostal, S. A.**, Apartado Postal 302, Havana
*Equipment:* 4 C-46's; 1 DC-3

**Expreso Aereo Inter Americano, S. A. (Expreso)**, Prado 50, Havana
*Equipment:* 3 C-46's

## DOMINICAN REPUBLIC

**Compania Dominicana de Aviacion, C. por A. (CDA)**, Ciudad Trujillo
*Equipment:* 4 C-46's; 2 DC-3; 1 Twin Engine Beechcraft; 1 DH Beaver

## ECUADOR

**Aerovias Ecuatorians C. A. (AREA)**, P. O. Box 2226, Quito
*Equipment:* 2 Boeing 307's; 4 DC-3's; 3 Navlons
*Total Employees:* 236
*Pilots Employed:* 18
(Scheduled passenger & cargo)

## EL SALVADOR

**Taca International Airlines, S. A.**, San Salvador
*Equipment:* DC-4's

## GUATEMALA

**Empresa Guatemalteca de Aviacion (Aviateca),** 12 Calle Poniente 6, Guatemala
*Equipment:* 7 DC-3's; 1 C-46
*Total Employees:* 340
*Pilots Employed:* 20

## HAITI

**Corps d'Aviation de l'Armee d'Haiti,** Bowen Field, Port-au-Prince
*Equipment:* C-45; DC-3
*Total Employees:* 107

## HONDURAS

**Servicio Aereo De Honduras, S. A.** (SAHSA), Avenida Colon y Cuarta Calle Tegucigalpa, D. C.
*Equipment:* 4 DC-3's

**Transportes Aereos Centro-Americanos, S. A. (Honduras),** Tegucigalpa

**Transportes Aereos Nacionales, S. A.** (TAN), Tegucigalpa, D. C.

## JAMAICA

### (British West Indies)

**Caribbean International Airways Ltd.** (CIA), Palisadoes P. O. Palisadoes Airport, Kingston
*Equipment:* 2 PBY5A's
*On Order:* 1 Grumman Goose
*Total Employees:* 40
*Pilots Employed:* 5

## MEXICO

**Aeronaves De Mexico, S. A. (Aeronaves),** Balderas 32, Mexico, D. F.
*Equipment:* 10 DC-3's; 1 DC-4; *On Order:* 4 Convair 340's

**Aero Transportes, S. A. (ATSA),** Juarez No. 117-A, Mexico, D. F.

**Aerovias Guest, S. A.,** Paseo de la Reforma, 95 Mexico, D. F.
*Equipment:* 3 DC-4's

**Aerovias Reforma, S. A.** (Reforma), General Offices: Aeropuerto Central, Apartado Postal 9648, Mexico, D. F.
*Equipment:* 10 DC-3's
*Total Employees:* 475
*Pilots Employed:* 45

**Aerovias Transcontinentales, S. A.,** 3-905 Dolores, Mexico, D. F.

**American Airlines De Mexico, S. A.,** Avenida Juarez 117, Mexico, D. F.
(Not an operating company)

**Cia. Mexicana De Aviacion, S. A. (MEXICANA),** Balderas 36, P. O. Box 901, Mexico, D. F.
*Equipment:* 19 DC-3's; 6 DC-4's; 2 DC-6's
*On Order:* 11 Convair 340's; 3 DC-6B's
*Total Employees:* 2,503
*Pilots Employed:* 199

**Eastern Air Lines, S. A.,** Edificio Eastern Air Lines, Reforma Y Morelos, Mexico, D. F.
(Not an operating company)

**Lineas Asociadas Mexicanas, S. A. (LAMSAO),** Balderas 32 Mexico, D. F.

**Lineas Aereas Del Pacifico, Avenida Ruiz** 40, Ensenada, B. Cfa.
*Equipment:* C-46; DC-3's

**Taca De Mexico, S. A.,** Avenida Juarez 93, Mexico, D. F.
(Not an operating company)

**Trans Mar De Cortes, S. A.,** Avenida Serdan 227-229, P. O. Box 54, Guaymas, Sonora
*Equipment:* 3 DC-3's
*Total Employees:* 73
*Pilots Employed:* 12

**Transportes Aereos de Jalisco, S. A.** (TAJSA), P. Moreno No. 602, Guadalajara, Jal.
*Equipment:* 2 DC-3's; 1 Cessna
*Total Employees:* 80
*Pilots Employed:* 6

## NETHERLANDS WEST INDIES

**K. L. M. Royal Dutch Airlines, West Indies** Division, 3 De Ruyterkade, Willemstad, Curacao, N. A.
*Equipment:* 8 DC-3's; 3 DC-4's

## NICARAGUA

**Compania Nacional Taca De Nicaragua,** S. A., Managua

**Lineas Aereas De Nicaragua, S. A.** (La Nica), Managua
*Equipment:* 7 DC-3's; 1 Navion

## PANAMA

**Cia. Panamena De Aviacion (COPA),** 25 Avenida Peru, Panama, R. P.

**Taca Airways, S. A.,** Ave. T. Rivoli 1, Panama City
(Not an operating company)


# New Lake Central Service

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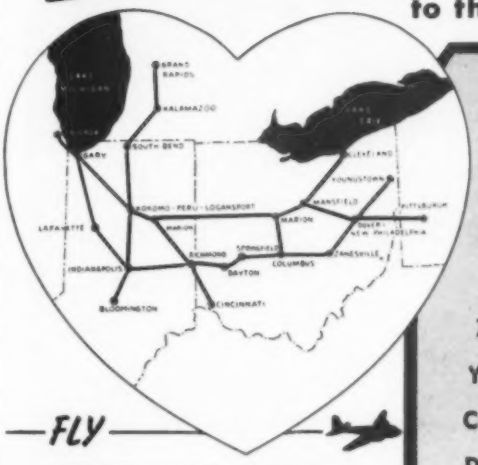


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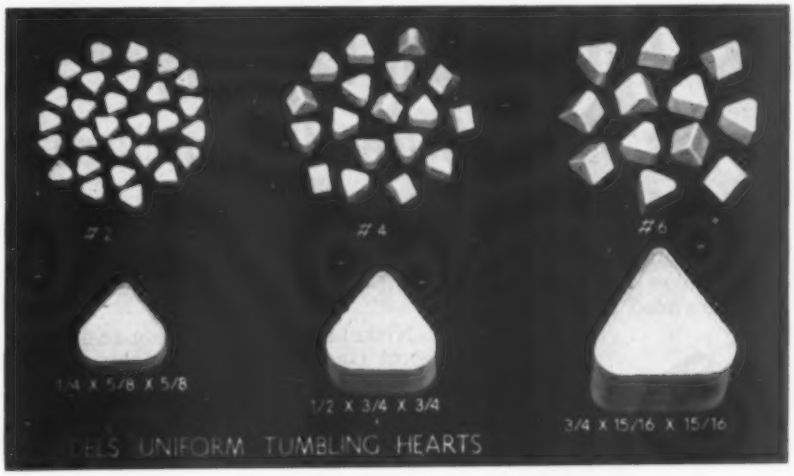


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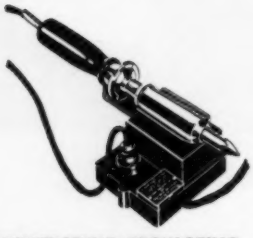

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- Nickel-coated, corrosion-resistant tips, easily and quickly replaced
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### PARAGUAY

**Aerovias Paraguatas, S. A.**, Asuncion (Not in operation)

**Linea Aerea de Transporte Nacional (LATN)**, Asuncion

### PERU

**Compania de Aviacion "Faucett," S. A.**, Hotel Bolivar 926, P. O. Box 1429, Lima
*Equipment:* 4 DC-4's; 7 DC-3's; 6 Faucetts

**Transports Aeroes Militares**, Lima-tambo Airport, Apart. 1414, Lima
*Equipment:* 8 DC's; 4 PBY-5A's; 6 Dragon Rapides; 1 Beechcraft; 3 Stinsons; 4 Beavers

### TRINIDAD

**British West Indian Airways, Ltd.** (BWIA), Airways House, Chacon St., P. O. Box 604, Port-of-Spain
*Equipment:* 6 Vikings; 4 DC-3's
*On Order:* 3 Vickers Viscounts

### URUGUAY

**Compania Aeronautica Uruguaya, S. A.** (Causa), Calle Colonia 1068, Montevideo
*Equipment:* Short Sandringhams

**Primeras Lineas Uruguayas De Navegacion Aera (PLUNA)**, Uruguay 1107, Montevideo
*Equipment:* 5 DC-3's

### VENEZUELA

**Aerovias Venezolanas, S. A. (AVENSA)**, Edificio Banco Union Chorro a Dr. Dias., Caracas
*Equipment:* 19 DC-3's; 2 DC-4's
*On Order:* 3 Convairs 340's

**Linea Aerea Taca De Venezuela, C. A.**, Conde a Carmelitas No. 13, Edificio Taca, Caracas

**Linea Aeropostal Venezolana (LAV)**, Bloque No. 1, El Silencio, Caracas
*Equipment:* National Division: Martin 202's; DC-3's; International Div.: Constellations
*On Order:* 2 L-1049C's

## Africa & Middle East

### ADEN

**Aden Airways, Ltd.**, 28186A, The Crescent, Steamer Point, Aden
*Equipment:* 6 DC-3's
*Total Employees:* 279
*Pilots Employed:* 15

### ALGERIA

**Compagnie Air Algerie**, 46 Bd. St.-Saens, Algiers
*Equipment:* 9 DC-3's; 6 SO 30 Bretagnes (Scheduled & non-scheduled passenger & freight service)

### ANGOLA

(Portuguese West Africa)

**Divisao de Exploracao dos Transportes Aereos (DTA)**, Caixa Postal 79, Luanda
*Equipment:* 8 Dragon Rapides; 2 Stinson Reliants; 2 PT 26A's; 1 Beechcraft UC43; 5 Beechcraft D-18's

### BELGIAN CONGO

**Societe Anonyme Belge d'Exploitation de la Navigation Aerienne (SABENA)**, Singer Bldg., 7 Blvd., Albert ler Leopoldville

### EGYPT

**Misrair, S. A. E.**, Almaza Airport, Heliopolis, Cairo
*Equipment:* 4 Languedocs; 7 Vickers Vikings; 1 Beechcraft; 1 Bonanza; 1 Gemini

**Services Aeriens Internationaux d'Egypte (SAIDE)**, 37 Rue Abdel Khalek, Sarwat Pacha, Cairo
*Equipment:* 3 SM 95's; 3 Fiat G212's

### ETHIOPIA

**Ethiopian Airlines, Inc.**, P. O. Box 1755, Addis Ababa
*Equipment:* 2 Convair 240's; 1 Norseman; 8 DC-3's

### IRAN

**Iranian Airways Company**, Ave. Saadi, Tehran
*Equipment:* 5 DC-3's; 2 Fairchild UC61A's; 3 DH Doves

### IRAQ

**Iraqi Airways** (Iraq State Railways), Baghdad, West
*Equipment:* 3 Vickers Vikings; 1 DH Dove

## ISRAEL

**El Al Israel Airlines, Ltd. (EL AL),** 31 Rothschild Blvd., P. O. Box 438, Tel-Aviv
*Equipment:* 3 Constellations; 5 C-46's
*Total Employees:* 1,200
*Pilots Employed:* 40

**Israel Inland Airlines Ltd. (ARKIA),** 70, Ahad Ha'am St., Tel-Aviv
*Equipment:* 2 C-46's; 1 Rapide; 1 Consul
*On Order:* 2DH-89A's
(Non-scheduled passenger & cargo)

## JORDAN

**Air Jordan,** P. O. Box 417, Amman
*Equipment:* 2 DC-3's; 2 Consul's
*On Order:* 1 DC-3; 1 Rapide
*Total Employees:* 30
*Pilots Employed:* 5

**Arab Airways Association, Ltd. (A.A.A.),** Station Road, P. O. Box 367, Amman
*Equipment:* 5 DH Rapides; 2 Airspeed Consuls; 1 Chrislea Ace; 1 Proctor; 1 Tiger Moth

## KENYA COLONY

**East African Airways Corp. (EAAC),** Airways Terminal, Sadler St., Nairobi
*Equipment:* 9 Dakotas; 2 Lodestars; 2 DH-89's

## LEBANON

**Air Liban,** Esseyli Bldg., Assour Square, P. O. Box 1243, Beirut
*Equipment:* 4 DC-3's; 1 Languedoc

**Middle East Airlines Co. S. A. (MEA),** Parliament Square, Beirut
*Equipment:* 6 DC-3's

## LIBERIA

**Liberian National Airways,** Robertsfield
*Equipment:* 1 DC-3; 1 DH Rapide

## MOROCCO

**Air Maroc,** 5 Avenue de la Republique, Casablanca
*Equipment:* 6 SO 30 Bretagnes; 4 C-46's
*Total Employees:* 280
*Pilots Employed:* 13
(Scheduled passanger & cargo service)

**Societe Cherifienne de l'Air (Air Atlas),** 167 avenue Poeymirau, Casablanca
*Equipment:* 6 DC-3's; 3 Languedoes
*Total Employees:* 187

## MOZAMBIQUE
### (Portuguese East Africa)

**Divisao de Exploracao dos Transportes Aereos (DETA),** Rua Araujo 103, Lourenco Marques
*Equipment:* 2 DH Hornet Moths; 1 DH Dragon Fly; 4 DH Dragon Rapides; 6 DH Doves; 2 Junkers 52's; 1 Lockheed 14H; 2 Lockheed Lodestars; 3 DH-3's

## NIGERIA
### (West Africa)

**West African Airways Corporation (WAAC),** P. O. Box 136, Airways House, Lagos
*Equipment:* 10 Doves; 3 Wayfarers; 2 Bristol Freighters; 6 Handley Page Marathons

## MALAYAN UNION

**Malayan Airways Ltd.,** Ocean Bldg., Singapore
*Equipment:* 11 DC-3's

## NEW GUINEA

**Gibbes-Sepik Airways Limited (G.S.A.),** P. O. Box 41, Port Moresby, Papua Territory
*Equipment:* 7 Norsemen; 2 Austers; 1 Lodestar
*On Order:* 2 Norsemen
*Total Employees:* 35
*Pilots Employed:* 10
(Scheduled & none-scheduled passenger & cargo service)

## NEW ZEALAND

**New Zealand National Airways Corp.,** P. O. Box 3038, Wellington, C. I.
*Equipment:* 21 DC-3's; 6 DH Dominies; 3 DH Moths; 4 DH Herons

**Tasman Empire Airways Ltd. (TEAL),** Mechanics Bay, C. P. O. Box 2201, Auckland
*Equipment:* 5 Solents Flying Boats
*Total Employees:* 694

## PAKISTAN

**Orient Airways Ltd.,** Orient House, Karachi Airport, Karachi-11
*Equipment:* 2 Convair 240's; 18 DC-3's; 1 Expediter; 2 L-5 Sentinels

## PHILIPPINE ISLANDS

**Philippine Air Lines (PAL),** M.R.S. Bldg., Plaza Cervantes, Manila
*Equipment:* Douglas DC-6B's, DC-6's, DC-3's and Convair 340's; *On Order:* 3 Convair 340's

## THAILAND

**Thai Airways Co. Ltd.,** Airway Bldg., 6 Lan Luang Rd., Bangkok
*Equipment:* DC-4; DC-3; Norseman; Bonanza

## REPUBLIC OF INDONESIA

**Garuda Indonesian Airways N. V.,** Djalan Nusantara 15, Djakarta
*Equipment:* 21 DC-3's; 7 Catalinas; 8 Convair 240's
*On Order:* 8 Convair 340's; 14 OH Herons
*Total Employees:* 3,400
*Pilots Employed:* 92

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Birmingham, Ala.

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## CEYLON

**Air Ceylon Limited**, P. O. Box 692, 3, Lotus Road Fort, Colombo 1
*Equipment:* 2 DC-4's; 2 DC-3's
*Total Employees:* 217

## CHINA

**Sino-Soviet Aviation Corporation (Hamiata)**, Tihwa
*Equipment:* Li-2's

## FIJI ISLANDS

**Fiji Airways**, Box 112, Suva
*Equipment:* 3 DH Rapides
*Total Employees:* 20
*Pilots Employed:* 3
(Scheduled cargo service)

## FORMOSA

**Civil Air Transport (CAT)**, 46 Chung Shan Road, Second Section, Taipeh
*Equipment:* 8 DC-3's; 23 C-46's; 1 PBY; 1 DC-4
*Total Employees:* 1,760


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| MP 10E Power Supply for above | $30.00 |
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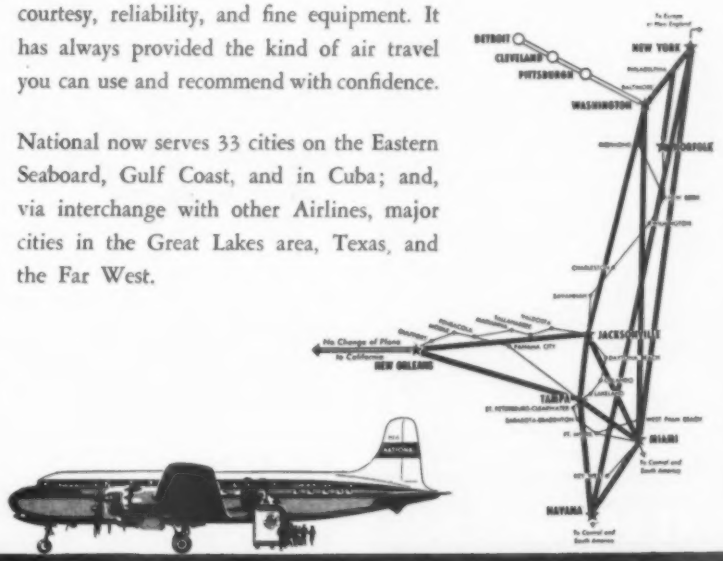


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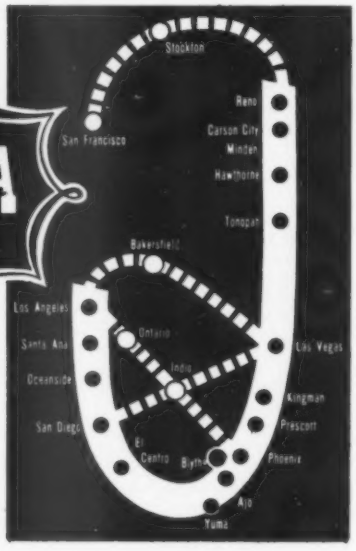


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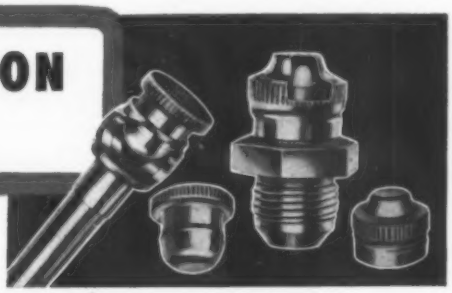

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## FRENCH INDOCHINA

**Air-Vietnam**, 123, Bd Bonard, Saigon
*Equipment:* 3 Bristols; 3 DC-3's; 3 DC-4's

**Societe de Transports Aeriens en Extreme Orient (COSARA)**, 5-13 Rue Turc, Saigon
*Equipment:* 4 DC-3's
*On Order:* 4 SO 30 Bretagnes

## HONG KONG

**Cathay Pacific Airways, Ltd.** (Cathay), 1 Connaught Rd., Central Hong Kong
*Equipment:* 1 DC-4; 2 DC-3's

**Hong Kong Airways Ltd.**, 18 Pedder St., Hong Kong
*Equipment:* DC-4's

## INDIA

**Air Services of India, Ltd.** (ASI), Scindia House, Dougall Rd., Ballard Estate, Bombay
*Equipment:* 8 DC-3's; 3 L-5 Sentinels

**Air-India International Ltd.**, Registered Office: New India Assurance Bldg., Mahatma Gandhi Rd., Fort, Bombay Administrative & Engineering Offices: Bombay Airport, Santa Cruz (East), Bombay 25
*Equipment:* 4 Constellations
*On Order:* 2 L-1049C's
*Total Employees:* 255
*Pilots Employed:* 22

**Air-India Ltd.**, Registered Office: New India Assurance Bldg., Mahatma Gandhi Road, Fort, Bombay Administrative & Engineering Offices: Bombay Airport, Santa Cruz (East), Bombay 25
*Equipment:* 11 DC-3's; 7 Vikings; 1 DC-4
*Total Employees:* 3.039
*Pilots Employed:* 63

**Airways (India) Ltd.**, Airways House, 15, Ganesh Chandra Ave., Calcutta, 13
*Equipment:* 17 DC-3's; 2 DH Doves

**Bharat Airways, Ltd.** (The Birla Line), 31, Chittaranjan Ave., Calcutta-12
*Equipment:* 10 DC-3's; 1 Avro; 1 Sentinel; 2 Skymasters
*Pilots Employed:* 41

**Deccan Airways**, Begumpet Airport, Begumpet I.P.O., Hyderabad, Deccan
*Equipment:* 11 DC-3's

**Himalayan Aviation Ltd.**, 9A, Esplanade East, Calcutta
*Equipment:* 7 DC-3's
*Total Employees:* 280
*Pilots Employed:* 16

**Indian National Airways Ltd. (INA)**, Malhotra Bldg., Queensway, New Delhi
*Equipment:* 5 Vickers Vikings; 7 Dakotas; 1 Twin Beech; 1 Single Beech

**Kalinga Air Lines**, Suite No. 140, Grand Hotel, Calcutta-13
*Equipment:* 6 DC-3's; 1 PBY-5A; 1 L-5
*Total Employees:* 300
*Pilots Employed:* 18

## JAPAN

**Japan Inernational World Airways (JIWA)**, Oak Bldg., Kyobashi 1-chome, Chuo-Ku, Tokyo

**Japan Air Lines Co., Ltd. (JAL)**, New Marunouchi Bldg. 4, 1-chome, Marunouchi, Chiyoda-ku, Tokyo
*Equipment:* 6 DC-4's; 2 Beech 18's; 1 Beech 11
*On Order:* 2 DH Comets; 3 DH Herons; 4 DC-6B's

## KOREA

**Korean National Airlines**, Head Office: No. 8, 2nd Ka, Choong-Ang Dong, Pusan
*Equipment:* C-46's

## UNION OF BURMA

**Union of Burma Airways (UBA)**, 104, Strand Road, Rangoon
*Equipment:* 3 DH Doves; 9 DC-3's; 2 HP Marathons; 1 Auster; 1 Consul

## SAUDI ARABIA

**Saudi Arabian Airlines**, Jidda
*Equipment:* 13 DC-3's; 5 Bristol Wayfarers; 5 DC-4's

## SOUTHERN RHODESIA

**Central African Airways Corp.** (CAAC), P. O. Box 1979, Salisbury
*Equipment:* 9 Vikings; 5 Beavers

## SUDAN

**Sudan Airways**, Sirdar Ave., P. O. Box 253, Khartoum
*Equipment:* 5 DH Doves
*On Order:* 1 Auster

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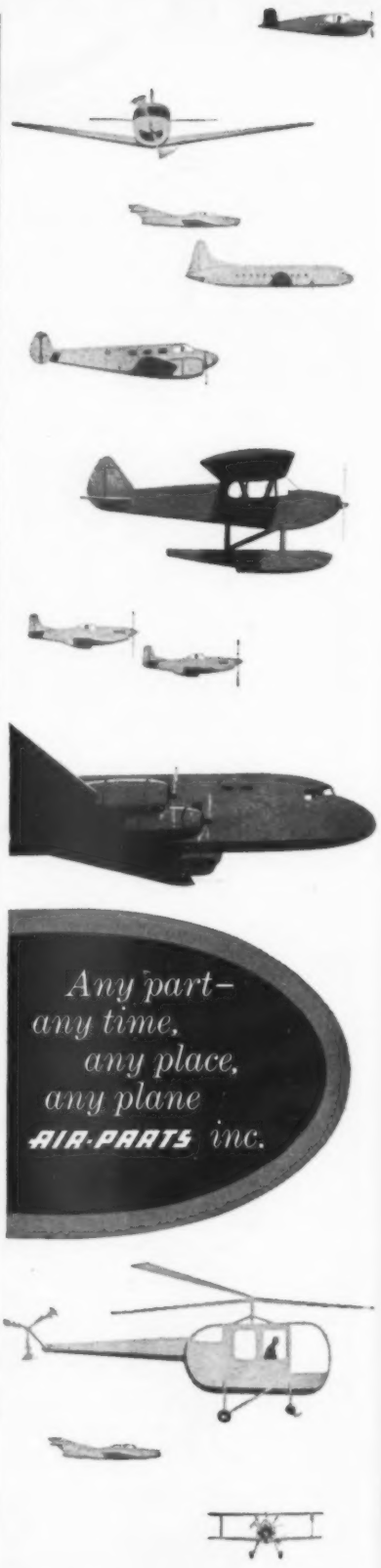


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## SYRIA

**Syrian Airways Co.**, P. O. Box 417, Damascus

## TUNISIA

**Societe Tunisienne de l'Air (TUNIS AIR)**, 1 Rue d'Athenes, Tunis
*Equipment:* 4 DC-3's; 1 Languedoc

## TURKEY

**T. C. Devlet Hava Yollari Genel Mudurlugu D.H.Y. (Turkish State Airlines)**, Ankara
*Equipment:* 33 DC-3's; 6 DH-89's
*Total Employees:* 919

## UNION OF SOUTH AFRICA

**Commercial Air Services (PTY) Ltd.** (Comair), P. O. Box 2245, Johannesburg (Rand Airport, Germiston)
*Equipment:* 2 Cessna 195's; 2 Cessna 170's; 6 Cessna 140's; 2 DH Doves
*Total Employees:* 40
(Scheduled & non-scheduled passenger & cargo service)

**South African Airways—Suid-Afrikaanse Lugdiens**, Rand Airport, Germiston, Johannesburg
*Equipment:* 4 Constellations; 7 DC-4's; 3 DC-3's; 11 Lodestars
*Total Employees:* 2,041

**Tropic Airways (Pty) Ltd.**, 209-211, His Majesty's Bldg., Johannesburg

# Australasia & Far East

## AUSTRALIA

**Airlines (W.A.) Ltd.**, 55 St. Georges Terrace, Perth, Western Australia
*Equipment:* 2 DH Doves; 4 Avro Ansons
*On Order:* 1 DH Dove

**Ansett Airways Pty. Ltd.** Commonwealth Airport, Essendon, Victoria
*Equipment:* 6 DC-3's
*Total Employees:* 300

**Australian National Airways Pty. Ltd. (A.N.A.)**, 390 Flinders St., Melbourne, C. I., Aerodrome, Essendon, Victoria, W. 6
*Equipment:* 9 DC-4's; 25 DC-3's; 3 Bristol 170 Freighters; 3 DC-3 Freighters

**Barrier Beef Airways Pty. Ltd.** (Reefair), Civil Aviation Flying Boat Base, Hamilton Brisbane, Queensland
*Equipment:* 2 Sandringhams; 2 Catalina PB2B's
*Total Employees:* 47

**British Commonwealth Pacific Airlines Ltd.**, A.P.A. Bldg., 53 Martin Place, Sydney, New South Wales
*Equipment:* 4 DC-6's
*Total Employees:* 317
*Pilots Employed:* 41

**Butler Air Transport Proprietary Ltd.**, Kingsford Smith Aerodrome, Mascot, Sydney
*Equipment:* 6 DC-3's; 1 DH 89; 1 DH Heron

**Connellan Airways Ltd. (Connellan)**, Alice Springs, N. T.
*Equipment:* 2 HD Rapides 89A's; 2 DH-90's 1 Auster Aiglet; 2 DH 82's; 1 Beechcraft D-17

**East-West Airlines Ltd. (EWA)**, P. O. Box 249 Tamworth Aerodrome, Tamworth, N.S.W.
*Equipment:* 3 Lockheed Hudsons
*Total Employees:* 50

**Guinea Airways Ltd. (G.A.L.)**, Airway House, 132 N. Terrace, Adelaide
*Equipment:* 3 DC-3's

**MacRobertson-Miller Aviation Co. Pty. Ltd. (M.M.A.)**, 194 St. George's Terrace, Perth Western Australia
*Equipment:* 3 DC's; 1 Lockheed 10; 5 Avro Ansons


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**Squeeze Grip Action Does it—*Patented***

The 3-piece Fall Wiper Ring assembled into one piece as covered by patents consists of (1) a one-piece Split Wiper Ring (body) with two flanges or groove in its O.D.; (2) a one-piece split compressor spring assembled in the groove (3) an endless cover band surrounding the spring in the groove which causes a squeeze grip action on the piston rod.

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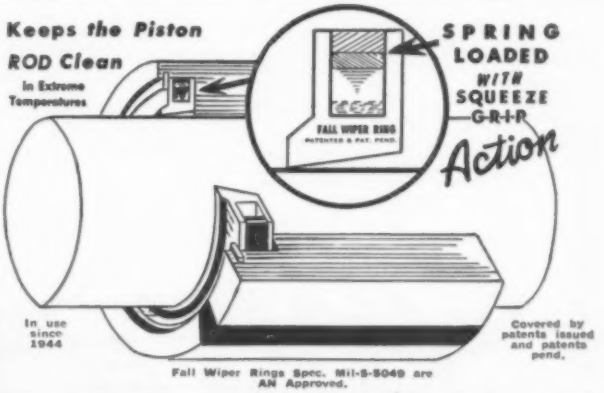
Keeps the Piston ROD Clean
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SPRING LOADED WITH SQUEEZE GRIP Action
FALL WIPER RING
In use since 1944
Covered by patents issued and patents pend.

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**Overland Air Services Pty. Ltd.**, Kingsford Smith Airport Mascot, Sydney
*Equipment:* 2 Lockheed Lodestars; 2 Avro Ansons
*On Order:* 2 Lockheed 10's

**Qantas Empire Airways Ltd. (QANTAS)**, Shell House, Carrington St., Sydney, New South Wales
*Equipment:* 6 Constellations; 2 Lancastrians; 4 Sandringhams; 13 DC-3's; 5 DC-4's; 6 DH 84's; 4 DHA Drovers; 4 PB 2B2's
*On Order:* 8 Super Constellations; 2 DHA Drovers
*Total Employees:* 4,106

**Queensland Airlines Pty, Ltd.**, Eagle Farm Airport, Box 217D, G.P.O., Brisbane
*Equipment:* 2 DC-3's

**South Coast Airways Pty. Ltd. (S.C.A.)**, Box 151, Wollongong, N.S.W.
*Equipment:* 3 Ansons; 1 Lockheed 10; 3 DH-82's; 1 Desouteer
*Total Employees:* 15
*Pilots Employed:* 5

**Townsville & Country Airways**, 41 Flinders St., Townsville, Queensland
*Equipment:* 1 DC-3

**Trans Oceanic Airways Pty. Ltd.**, Flying Boat Base, Rose Bay, Sydney, N. S. W.
*Equipment:* 3 Short Solents; 2 Short Hythes

**Trans-Australia Airlines (TAA)**, 339 Swanston St., Box 2806AA, G. P. O. Melbourne. C. I., Victoria
*Equipment:* 24 DC-3's; 4 DC-4's; 5 Convair 240's; 4 DH-84's; 4 DH-A3 Drovers; 2 Lockheed Lodestars
*Total Employees:* 3,443

**Woods Airways Pty., Ltd.**, Box K 783, G.P.O., Perth
*Equipment:* 2 Avro Ansons

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September 5, 1951

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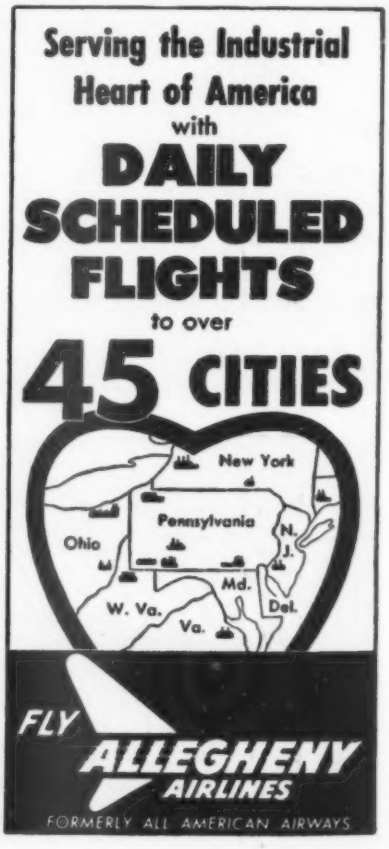

# here's how IDEAS pay off at UNITED

## for the employees

Creative thinking in every phase of United's operation comes from the men and women of the company in the form of hundreds of suggestions a month, submitted to the United Air Lines Suggestion Program. During 1952, 6700 suggestions were offered, of which 1350 won awards. $27,000 was paid in awards to men and women of vision and imagination.

## for the company

And since every Employee Suggestion Program award represents a percentage of the definite benefit accrued by the company as a result of adopting the suggestion, this means that United has—with the use of each new idea—increased the quality and efficiency of its operation from New York to Honolulu—all along the 13,250-mile Main Line Airway.

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The real test of any improvement is its significance to the public. Today, Mainliner travelers enjoy finer service than ever, as a result of the Suggestion Program. Whatever the new idea concerns . . . maintenance . . . a new fuel . . . a new reservation procedure . . . the traveling public receives the benefit — finer United service.

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# *What* JACK & HEINTZ *is doing about...*

**New commercial starter announced by J&H is forerunner of many products to be designed especially to airline requirements.**

**Improved version of famous JH6 Starter offers greater service life and maintenance economy.**

**Incorporates 10 new features requested by engineering and maintenance personnel of the nation's airlines.**

Through close association with commercial airlines, Jack & Heintz has long recognized the need for specially designed accessories that would give longer service with less maintenance under airline usage. Military specifications designed for extreme performance under combat conditions do not meet the requirements for commercial operations.

J&H has now come up with a series of new commercial starters, the first of a new line of products designed especially to airline requirements.

Airline personnel—engineers and maintenance men—have contributed to the design of these starters through recommendations based on their needs, tests and experience. These recommendations were combined with our own experience on both military and commercial designs. The result is 10 new features incorporated into the famous JH6 Starter (illustrated above right). These starters are designated as the JH6C series. Truly "made to order" for commercial airlines, they offer extended service life due to added strength of com-

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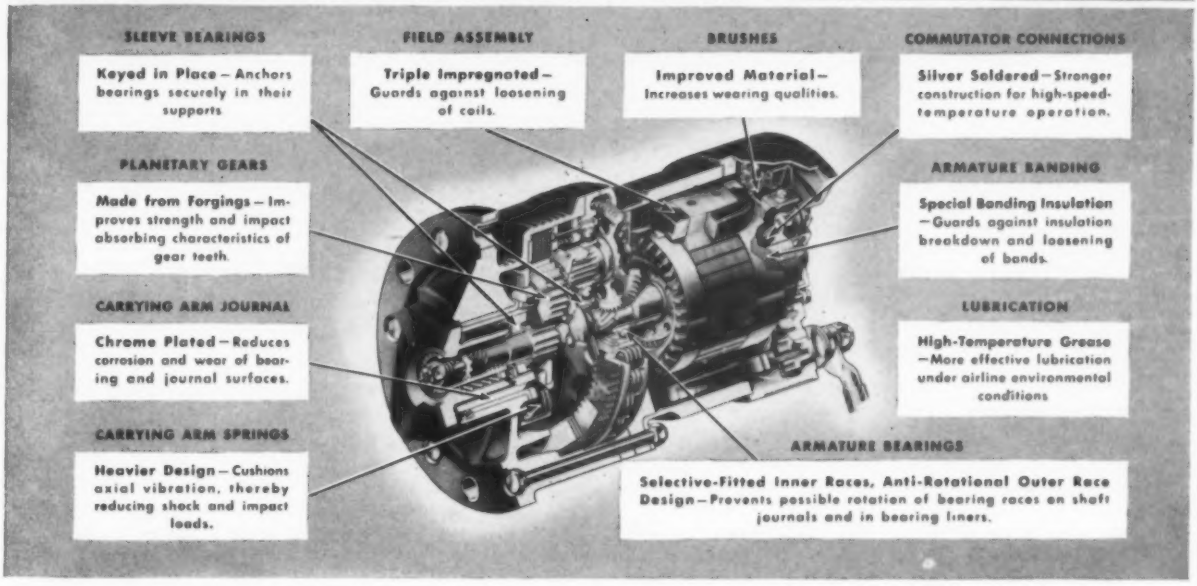
## TYPICAL IMPROVEMENTS ON J&H COMMERCIAL STARTERS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BRUSHES
Improved Material – Increases wearing qualities.
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Made from Forgings – Improves strength and impact absorbing characteristics of gear teeth.
ARMATURE BANDING
Special Banding Insulation – Guards against insulation breakdown and loosening of bands.
CARRYING ARM JOURNAL
Chrome Plated – Reduces corrosion and wear of bearing and journal surfaces.
LUBRICATION
High-Temperature Grease – More effective lubrication under airline environmental conditions
CARRYING ARM SPRINGS
Heavier Design – Cushions axial vibration, thereby reducing shock and impact loads.
ARMATURE BEARINGS
Selective-Fitted Inner Races, Anti-Rotational Outer Race Design – Prevents possible rotation of bearing races on shaft journals and in bearing liners.

ponents, and greater resistance to vibration, wear and corrosion.

Three JH6C Starter models are presently available which can be modified for application on any aircraft reciprocating engine currently in use by the airlines.

*This new series, with its many advantages, does not obsolete the JH6 Starters now in world-wide service, since all JH6C parts are interchangeable with their counterparts in the JH6 Starters, except the keyed-in-place sleeve bearings.*

## J&H looks to the Future

Two other new Jack & Heintz products, part of the program for equipment "tailored" to airline needs, have recently completed rigid service tests.

The first is a new propeller synchronizer generator, which is used as the source of sensing power for an electric propeller-synchronizing arrangement, as well as for the actuating of a synchronous motor-type indicator.

The second is a generator with the lowest overhung moment for its output in the industry. It supplies adequate power for check-out at ground idle, in addition to normal output at operating speeds.

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Rotomotive EQUIPMENT

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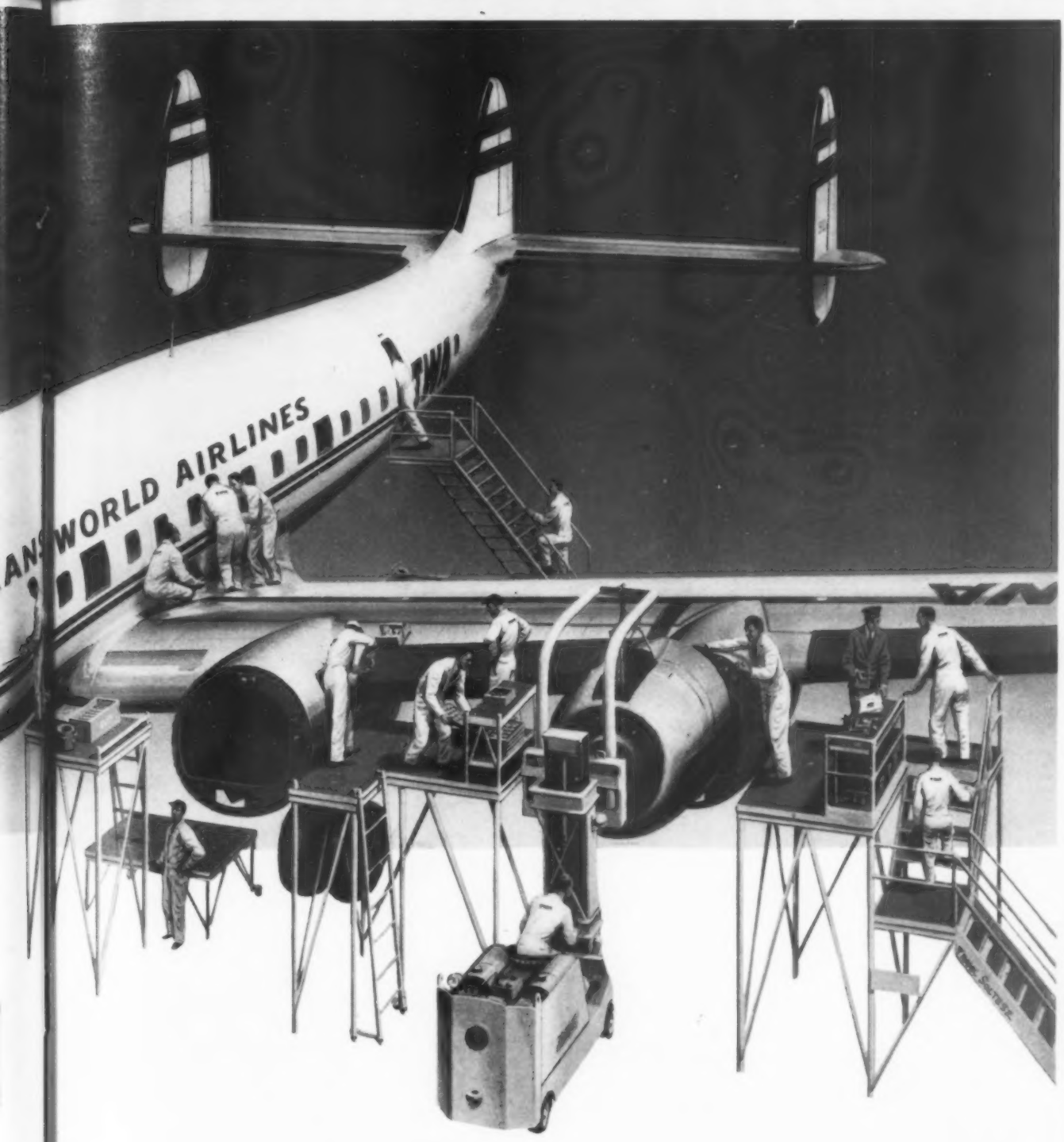
# TWA's OPERATION 7

*and what it means to you!*




You're looking at TWA's famous "Operation 7" in action . . . one of the most exacting overhauls a modern airliner can get. It involves every part of the plane, from wing tip to wing tip, nose to tail. It takes six days, 4,500 man-hours, to complete. It is another of the reassuring reasons why . . . across the U. S. and overseas, *you can depend on TWA.*

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# NOW IN PRODUCTION BENDIX DISTANCE

**THE EQUIPMENT.** Ground and airborne equipment work together in DME. The airborne receiver-transmitter is known as an interrogator. The ground station, which is always located at a VOR site, is known as a transponder. DME operates in the frequency range from 960 to 1215 megacycles, in the UHF portion of the radio spectrum.

Above is the Bendix DME cockpit indicator. In this picture it is set at the 0 to 200 mile position. But when the aircraft is 40-miles from the ground station, the range dial can be switched to the 0 to 40 position . . . so that the dial can be read more easily.

**HOW IT WORKS.** The interrogator in the plane radiates a series of radio frequency pulses. These are received at the ground station where they *trigger* the ground transponder . . . which in turn, transmits a reply signal to the plane. The elapsed time, in microseconds, between transmission of interrogation signal and reception of the reply signal is used to compute automatically the slant distance between the plane and the point where the ground station is located. No triangulation or other time consuming effort is required of the pilot. He merely reads the distance in miles on the DME indicator in the cockpit. (In example above aircraft is 45 miles from ground station.)

# for the first time...
# MEASURING EQUIPMENT

To executive type and corporate aircraft, DME means economic, direct flights over unmarked airways . . . with a positive geographical fix at all times. It makes possible instrument approaches to near-to-destination airports that otherwise might have to be passed up.
To all planes, DME means better use of the sky. Better holding procedures . . . more accurate ETA's . . . less wasted space on longitudinal and altitude separations . . . expediting arrivals and departures. DME gives *provable* saving in operating costs.

You've been hearing about DME since 1946. Now it's available. Developed by Hazeltine Electronics. Flight tested. Ready for installation by Bendix Radio. It's the airborne (DME) instrument that accurately measures the distance of a plane from a ground station. All set to work with some 300 VOR and ILS ground sites that have been installed in anticipation of this DME development, that had to come in system navigation.

### Reduces operating costs

DME is a brand new navigation and safety aid. But even more, it brings *provable* reduction in operation costs. Cold cash savings that you can pick up and see. DME/VOR brings savings in fuel consumption . . . flight time convenience to passengers, better traffic control.

### Holding at Unmarked points

Holding for the big and congested airports is no longer limited to range intersections, homing facilities or airway markers. With Bendix DME, aircraft can now hold at any point within range of a DME/VOR station. Holding patterns can be tighter, closer in, more accurately executed. Holding can now be on actual distance covered, not on elapsed time. No more need for wasteful wide-area "Buffer Zones." Holding away from airway intersections, means too, that through traffic can go by without delay.

### Unmarked airways

Much of the travel of the executive or corporate type aircraft usually ends up off the beaten path. DME means time and money saved on these flights. Any pilot in a Bendix DME equipped plane, flying within range of a VOR/DME range station can pinpoint his location any time he wants to on an unmarked route. He can have a continuous navigational fix. With azimuth information from the VOR range, and with distance reading information on his DME, the pilot knows his geographical location at all times.

### Instrument approaches to fields

If any, of the fields served infrequently, or not at all by the scheduled airlines, could be approached safely with VOR alone. Now for the first time, Bendix VOR plus Bendix DME gives pilots both a bearing . . . and the precise slant distance to the minimum let-down point. Are there obstructions near the airfield? A television tower? A smoke stack? A warehouse? The latest map shows them. Your Bendix DME/VOR provides a reliable way to determine that the obstacle has been passed on an approach . . . and that a let-down may be safely started.

### More accurate ETA's

The Bendix DME allows the pilot to estimate arrival times more accurately. Flight tests prove that a pilot with DME on his instrument panel can forget about head winds, tail winds . . . triangulation, etc. His ground speed is always right in front of him on the Bendix DME computer. All it takes is a little mental arithmetic (like how far did I fly in one minute . . . two minutes?) Whatever the change . . . the pilot can adjust his power to maintain his promised ETA. Accurate ETA's reduce holding and altitude-changing along the airways. They reduce wasteful time separations. Save time, money and increase passenger convenience.

### Orbiting

Orbiting . . . regardless of wind conditions, a pilot is now able to fly an accurately controlled circular course. This exact arc can be flown around a DME/VOR at selected distances from the station and at varying altitudes.

This expedites departures and arrivals. It bypasses holding stacks at intersections. It all saves time, fuel and money.

And as pilots become more familiar with DME/VOR many other advantages will be developed. Bendix DME is another great step forward in system navigation. For further information, write to Bendix Radio, 2120 North Charles Street, Baltimore, Md.

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The huge Boeing B-52 Stratofortress is the newest weapon being built for America's air arsenal. It is, in a sense, a double-edged weapon. Respect for its retaliatory striking force is a deterrent against aggression. And it is a weapon of offense that, if need arose, would add great strength to our strategic air arm.

This giant new Boeing is engineered to strike at sources of war power deep behind hostile frontiers. To accomplish this the Stratofortress is designed to carry heavy loads over vast distances—at high speed and extreme altitude. Such performance is necessary to counteract the efforts a potential enemy would make to protect vital targets.

Powered by eight powerful jet engines, the B-52 measures 185 feet from wing tip to wing tip, and its gross weight is more than 150 tons. Its speed and ceiling, though not revealed, are unique for an aircraft in the heavy bomber class.

Boeing is actively in production on the B-52. This air giant, and the six-jet B-47 medium bomber, have given Boeing more experience with multi-jet aircraft than any other company. This background, together with Boeing's 36-year history of sound engineering and production integrity, gives assurance that the B-52 will inherit the tradition of rugged dependability established by Boeing's Flying Fortresses and Superforts of the last war.

For the Air Force, Boeing is building the
**B-47 Stratojet, C-97 Stratofreighter and the B-52 Stratofortress;**
and for the world's leading airlines, Boeing has built fleets of twin-deck Stratocruisers

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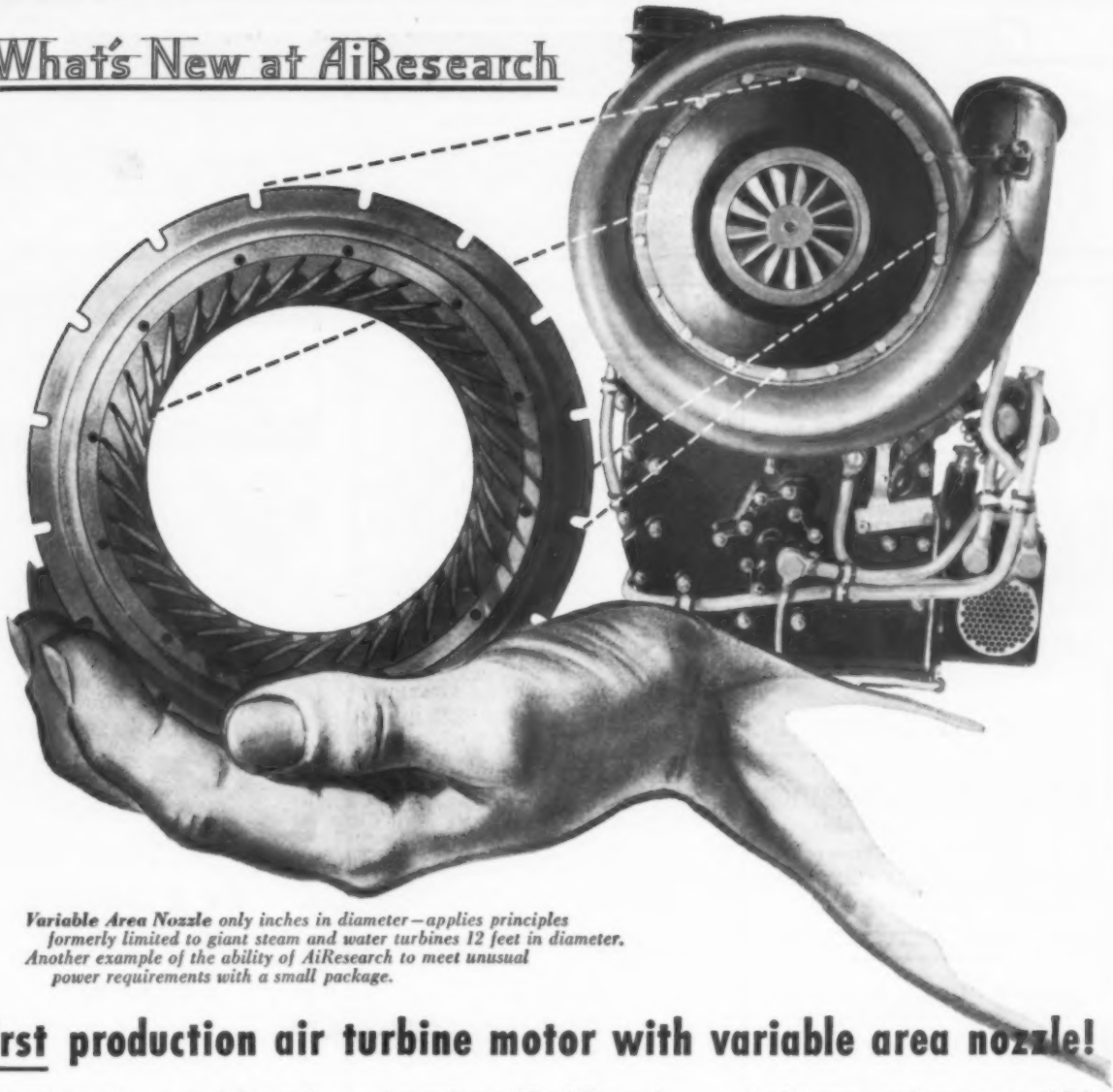
# What's New at AiResearch



***Variable Area Nozzle** only inches in diameter—applies principles formerly limited to giant steam and water turbines 12 feet in diameter. Another example of the ability of AiResearch to meet unusual power requirements with a small package.*

## First production air turbine motor with variable area nozzle!

During the past few years, AiResearch scientists have pioneered a whole new power technology in the development and operation of *small* air and gas turbine motors.

An example is this 52HP air turbine motor, shown above. Now in production for leading turbine propelled aircraft, this motor is one of 23 basic pneumatic power machines developed and manufactured by AiResearch.

*This motor incorporates a variable area nozzle,* first developed by AiResearch.

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The air turbine motor drives hydraulic pumps and constant-speed DC generators and alternators, formerly driven by the main engine. Its four accessory pads permit remote location of accessory functions, thus eliminating service operations in the engine nacelle.

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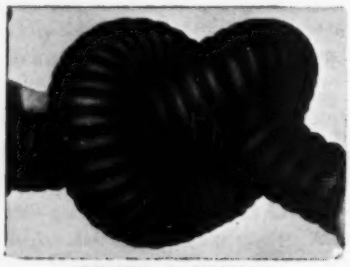

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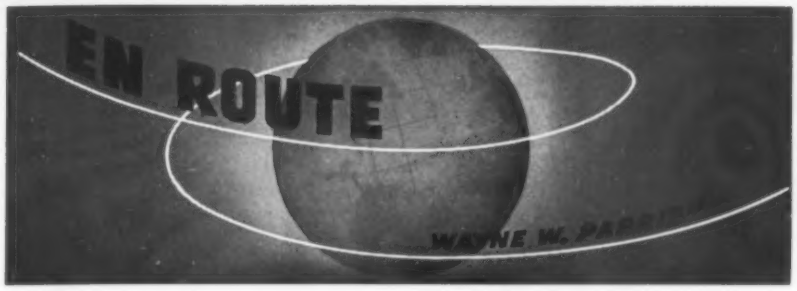



*"The world is a book and he who stays at home reads only one page."*

**Good Food.** Good food I remember while globetrotting: the reindeer meat cut into small pieces and cooked in rich brown gravy and poured over a heap of mashed potatoes at the hotel in Rovaniemi on the Arctic Circle in Finland . . . and the Arabic bean dish called *humas* which I had on the terrace of the apartment of **Norm Blake** of PAA in Beirut, Lebanon . . . and the *Kanguruhschwanz suppe* (Kangaroo tail soup) served at Schiphol Airport in Amsterdam.

And that delicious Russian cream pea soup with bacon pieces called *Sopa Veseny* in that wonderful grill of the Plaza Hotel in Buenos Aires and the very light *Soufflé Paprika* in the same place . . . and the fine dinner at the Hotel de Brasseur in Luxembourg, which began with vegetable cream soup and went on to a good filet with delicious bearnaise sauce and a tomato salad with superb dressing and topped with a 1950 dry white Reisling local wine and ending with the specialité of the house, a magnificent chocolate soufflé.

**Impressions.** Things I remember especially: awakening on a lazy summer morning to the melodious hawking of street vendors in Lisbon . . . the modern touch of loudspeakers chanting the prayers from minarets in the Middle East . . . the blast of hot humid air which greets you at the night stop at Bahrein airport on the edge of the Arabian desert and the whirling of ceiling fans in the quiet terminal building while waiting for take-off . . . and do you know that there are 588,000 bars in France, outnumbering bakeries 12 to one?

The worst customs and immigration in the world are at Manila in the Philippines, and passengers sit in the suffocating heat of the airplane while the public health officer leisurely checks each one before unloading . . . and at Prestwick Airport in Scotland, those 21 good oil paintings of scenes around the world and how Molotov, while passing through the airport during World War II, provided the artist Tom Gilfillan with a photo of the Kremlin to serve as the model for the Moscow panel.

**Berries and Camels.** In Paris in the summertime, those tasty wild strawberries *fraises des bois* — to be found in every restaurant . . . and in the Middle East, the way the Arab men kiss each other when greeting on the street . . . the spectacular view of Calcutta, India, from very high in the sky in a Comet, showing the entire sprawling city of ten millions and the boat-clogged river at a single glance . . . and the camel caravans and wild monkeys on the road from Delhi to the Taj Mahal . . . and, no matter how you slice it, the Taj Mahal is the most beautiful building in the world and worth saving for a lifetime to see.

How badly Brussels needs a new airport and especially a clean transient area . . . one place around the world you'd better be careful going to: there were 23 homicides in a single year, 14 by pistol and eight by knives. Where? Houston, Texas . . . Congratulations to Bangkok, Thailand, for a handsome new airport terminal and a tastefully decorated and equipped restaurant, bar, and lounge, and a good menu . . .

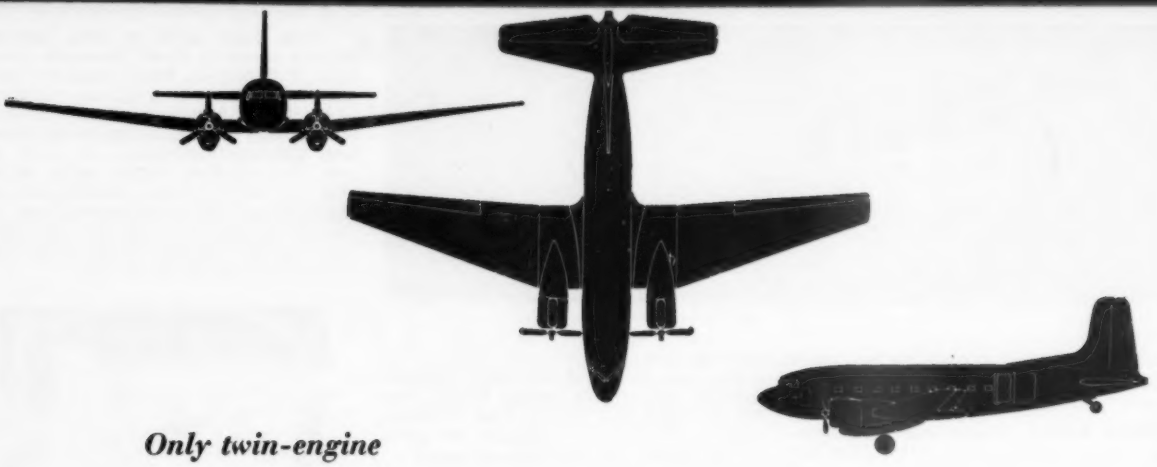
**Rio Highlights.** If you drive a car in Rio de Janeiro and run over a pedestrian, get out of sight as fast as possible. If you can stay hidden for 24 hours, you are immune to prosecution. If you go to the aid of an injured person, even if you are just a bystander, you are automatically held responsible for the person's recovery and care of his family. A dead body has actually remained over 12 hours on a main street in Rio because nobody dared touch it and the police were a little slow in arriving.

And while we're on Rio, the delightful home of **Paulo Sampaio,** president of Panair do Brasil, with its valuable collection of religious paintings and art, the collection of 150 porcelain apothecary jars, old Dutch furniture, and 16th century maps . . . and the new Rio stadium which seats 155,000 and can accommodate 200,000 and how the playing field is separated from the stands by a moat to prevent riots during and after soccer games. They take their sports seriously in Rio.

**Cows and Trams.** Most baffling experience: Read all you want in advance, but nothing can properly prepare you for Calcutta, a vast city literally swarming with people. Those sacred cows wandering through modern streets, blocking traffic, lying on the sidewalks or wandering into stores, a fantastic sight. Nobody dares touch them except to get milk and to pick up the dung which is carried to homes and dried in patties and used as fuel, so on those humid mornings the pungent odor of tens of thousands of dung fires hangs over the vast city like a pall. The contrast of automobile traffic, buses, trams, and the endless numbers of cows is strange indeed.

And how the Indians sleep on the sidewalks at night in this overcrowded city, so thick in front of the Great Eastern Hotel at 6 a.m. that it's difficult to pick your way, an incredible sight. And the hotel itself, Calcutta's best, a depressing hulk with its dim high-ceilinged halls and drab rooms . . . Life expectancy of the average Indian has risen eight years in the past decade: it's now 29. Think of it! Before the war seven million died annually from starvation in India, today the increasing population is a ghastly problem defying any logical laws of comprehension . . . on the way to Dum Dum airport ragged children were watching a sideshow with its tinny music at 6 a.m.

**City of the Dead.** Unusual sightseeing tour in Buenos Aires is a visit to a big cemetery. Truly a city of the dead with streets, elaborate vaults, marble stairways leading down as much as 30 feet, all vaults complete with chairs, fancy lace, flowers, paintings, and statuary. Some plots cost up to $500,000, believe it or not . . . most depressing capital in the world is Asuncion, Paraguay, with its poor streets, unkempt government offices, buildings pock-marked from shootings, many oxen, pregnant women, police red tape, gauchos from the country wearing embroidered pantaloons, and the national Pantheon with windows out and dirty interior.



*Only twin-engine*

*transport that makes regular flights*

*to Hawaii, the Navy's*

## Douglas R4D-8

Unique among twin-engine aircraft is the Navy's Douglas R4D-8. On orders, this transport can take off at San Francisco and safely wing its way across 2,562 miles of open Pacific to Hawaii.

Born of the Douglas DC-3, world's best known airplane, R4D-8 is longer, more powerful and flies on new swept wings. It carries 2,800 more pounds of payload 45 m.p.h. faster than its famous parent. Ceiling and range are greater. Passenger and freight loading are easier, quicker. And along with its improved performance, the Douglas R4D-8 still combines DC-3 reliability with twin-engine economy.

Development of the R4D-8 is another example of Douglas leadership in aviation. Planes that can be produced in quantity to fly *faster and farther with a bigger payload* are a basic Douglas rule.

*Enlist to fly with the U.S. Navy*

**Depend on *DOUGLAS*** **First in Aviation**

# News at Deadline

## David L. Behncke Dies

A heart attack last week caused the death of David L. Behncke, 55, founder and president of the AFL-Air Line Pilots Association for more than 20 years. Ousted as president in July, 1951, and temporarily reinstated by a court edict, he finally yielded all claims to ALPA's top post last December in return for a $7,500 pension, which will now be transferred to his widow.

Behncke was a long-time advocate of an Independent Air Safety Board. At the time of his death he was reportedly a consultant to the Mayors' Committee on Newark Airport.

## Jet Market Not Imminent—Douglas

Douglas Aircraft President Donald W. Douglas has told stockholders that the company definitely is going ahead with construction of a jet transport. He added, however, that he did not know "when we will release our DC-8 design to the shop."

He pointed out that Douglas now has $180 million in orders for DC-6B's and DC-7's and other transport builders' backlogs would bring the total for piston airliners to nearly $500,000,000. "In the light of those figures to consider the jet transport market as imminent would be contrary to common sense," Douglas declared.

## Pearson Leaves Martin

C. C. Pearson, president of The Glenn L. Martin Co. from July, 1949, to February, 1952, and later vice president for operations after George M. Bunker was brought in as president in a reorganization, has resigned and returned to the west coast. He has not yet announced a new connection.

He had held several top posts with Douglas Aircraft and Curtiss-Wright before joining Martin.

## Qantas Increases Super Connie Order to Seven

Qantas Empire Airways of Australia has upped its order for Lockheed Super Constellations from three to seven and will use the aircraft on its routes to London, Singapore and Johannesburg. First three are to be delivered early in 1954; the rest in 1955. The airline has also been authorized to place orders for six Bristol Britannia 300 turboprop transports for 1957-58 delivery.

## G.E. Strike in 2nd Month Parts Supplies Affected

The General Electric strike at Evendale, Ohio, involving 5,600 CIO-Autoworkers and AFL-Machinists, which had cut off production of J47 jet engines, went into its second month with no sign of an early break. GE did begin limited production and testing of the engines, but none were being shipped. A court injunction was obtained to limit mass picketing, and some of the strikers started returning to their jobs.

Meanwhile, the walkout was affecting hundreds of G-E suppliers, who were told to make no shipments. Ryan Aeronautical Co., however, has decided to continue J47 parts production to avoid layoffs and is stockpiling them pending an end to the walkout. This policy is tieing up about $45,000 a day of Ryan's working capital because G.E. is not paying for the stored parts.

## No Union Shop: AIA

Robert B. Watts, vice president and general counsel for Consolidated Vultee, told both the Senate and House Labor Committees that the Aircraft Industries Association is firmly opposed to all forms of compulsory union membership, including the union shop.

Testifying on amendments to the Taft-Hartley Act, as an official spokesman for AIA, Watts also asked that anti-trust laws be amended to apply clearly to labor unions. He indicated AIA has no objection to extending the non-communist affidavit provisions of the law to employers as well as union officials.

## 12 Convairs for KLM

KLM Royal Dutch Airlines, which now operates 12 Convair 240's, has increased its order for 340's from six to 12, all of them to be delivered by the end of 1954. First of the 340's is to be delivered in September.

## Chicago-NY: 65 Minutes

A USAF Boeing B-47 jet bomber made a flight from Chicago to New York (725 statute miles) in 65 minutes with the aid of high-altitude winds during its 1,000 hour accelerated service test program for an average speed of 659 miles per hour. On another flight, again aided by jet streams, the Stratojet held a 794-mph ground speed for 30 minutes.

## Korean War End Won't Hurt Airlines—Patterson

United Air Lines President W. A. Patterson feels an end of the Korean war would have little effect on airline business. He predicted the estimated 15% abnormal demand created by the emergency would probably be offset by normal increases within a year.

These gains will be made by continuing to penetrate the first-class market by two to four per cent yearly and the lower-fare tourist market by expansion of those services.

## Temco, Luscombe Merge

The merger of Temco Aircraft Corp. and its subsidiary, Luscombe Airplane Corp., has been completed, and the Luscombe name has been dropped. The former Luscombe plant will now be known as Temco's Garland, Tex., facility.

## Adams Favors Expanded Air Coach Service

CAB Member Joseph P. Adams says air carriers must change their thinking so that airline travel will no longer be a luxury but a necessity. He feels the present 80-20 ratio of first class to coach passengers must eventually be reversed so that only one fifth of air travelers will be going first class, roughly the same ratio experienced by the railroads last year.

## CAB Renews Two Local Service Certificates

Allegheny Airlines' local service certificate was renewed until the end of 1956 by CAB and the carrier was also granted new segments between Cleveland-New York and Cleveland-Philadelphia.

Simultaneously, Southern Airways' certificate was extended to the same date. Changes in Southern's route structure include addition of Monroe, La., and Gulfport-Biloxi, Miss., deletion of the segment between Charleston, S. C., and Columbus, Ga., and elimination of Hattiesburg, Miss., and Rock Hill, S. C.

In other actions, CAB also:

• **Extended Mohawk Airlines' route** from Elmira/Corning, N. Y., to Bradford, Pa.

• **Extended Colonial Airlines' route** from Allentown/Bethlehem, Pa., to Philadelphia.

• **Permitted TWA to suspend service** to Lancaster, Pa. (which Colonial was told to serve temporarily pending investigation) and Wilmington, Del.

• **Gave American Airlines approval** to suspend at Huntington, W. Va., and Erie, Pa.

## Six Members Added To Convair Board

Six representatives of the General Dynamics Corporation will be made directors of Consolidated Vultee Corporation after a change of Convair's by-laws increased the board membership from 12 to 18.

If three other present Convair directors follow Chairman Floyd Odlum's steps and resign as reported, General Dynamics' interests will occupy 10 seats on the new 18-man board with John Jay Hopkins, president and chairman of General Dynamics, set to succeed Odlum.

## Delta, C&S Merge May 1

Target date for the merger of Delta and Chicago & Southern Air Lines is now May 1 following stockholders' vote of approval. Stewardesses, pilots, and flight superintendents of the two carriers have agreed on master seniority lists.

## Airline Hangars to Get Fast Tax Write-offs

The Office of Defense Mobilization has established a new policy whereby maintenance and overhaul hangars put up by airlines could be amortized in five years for tax purposes. The quick write-offs are permissible, according to the Defense Air Transportation Administration, because they complement the 600 airliners which will be amortized under ODM's expansion goal.

Under the new program, the following hangars will be amortized in five years at 60%: Eastern Air Lines at Miami ($3,750,000); TWA at Chicago ($3,000,000); Western Air Lines at Seattle-Tacoma ($250,000); PAA at Seattle-Tacoma ($700,000); and National Airlines at Miami ($300,000).

Normally, overhaul facilities built by the airports themselves may not qualify for certificates of necessity because, in almost every case, a public body owns the field. ODM, however, has made an exception for Lockheed Air Terminal at Burbank, Calif., a privately owned field, approving 60% of $61,066 in new airport facilities. Other certificates are expected for the Burbank base.

## Wage Board Abolished

The Railroad and Airline Wage Board, set up to handle stabilization cases involving firms subject to the Railway Labor Act, has gone out of existence after processing 437 airline cases since it was created in September, 1951. Of these 254 were approved, 87 modified, and 13 denied.

## ACTA Flying 71 Planes

Aircoach Transport Association claims its 40 member irregular lines are now operating 71 aircraft, including 32 C-46's, 21 DC-3's, 12 DC-4's, five Martin 2-0-2's, and one Constellation. All but two of the C-46's and two of the DC-3's are made available for military contract movements, ACTA said.

## 500 Canadiar F-86E's

Production of the North American-licensed F-86E Sabrejet by Canadair, Ltd., of Montreal has now passed the 500 mark. Between 300-400 of the planes are to be supplied to Britain's Royal Air Force by the Canadian government.

Canadair is also turning out 500-600 Lockheed-licensed T-33A jet trainers powered by the Rolls-Royce Nene and expects to begin output of the Beech T-36A piston trainer by the end of 1953.

## Newhall Elected

Charles W. Newhall, Jr., has been elected president of Flight Refueling, Inc., and Myron B. Gordon, former vice president for Fairchild Engine and Airplane Corp., was elected board chairman. Newhall is a director of both FRI and Reaction Motors, Inc., which recently acquired an interest in the refueling firm.

## UAW Wins at P&W

By a vote of 1633 to 783, the CIO-Autoworkers topped the AFL-Machinists in a National Labor Relations Board representation election at Pratt & Whitney's North Haven, Conn., plant, giving the UAW its first bargaining rights at P&W. The IAM is the bargaining agent at P&W plants in East Hartford and Southington, Conn.

The NLRB previously threw out an election at North Haven in which the UAW was the victor, claiming that a fake telegram, allegedly sent by the president of the IAM, had confused the voters.

## Colonial Loses $186,821

Colonial Airlines' net loss after taxes last year was $186,821, compared with a net profit of $76,553 for 1951. Operating revenues, however, increased from $6,737,178 to $7,252,841 in 1952. President Branch Dykes said CAI operated at a profit in the last half of 1952 only because of $2,500 a day in government subsidies.

## 17 Comet III's for BOAC

British Overseas Airways is holding an option on 17 de Havilland Comet III's with anticipated first deliveries late in 1956. Planes will be adapted for 58 first-class passengers or 79 in tourist class.

## CAA Grounds C-54's

CAA has grounded C-54's equipped with Pratt & Whitney R-2000-4 engines leased by the Air Force to The Flying Tiger Line, Overseas National Airways, Transocean Air Lines, and Seaboard & Western Airlines, following a series of engine failures. Before further flight, C-54 group must be inspected and certain engine parts replaced.

## Cooperate With German Industry, Hurley Urges

The German press quoted Curtiss-Wright head, Roy Hurley, during a visit to Germany, as stating that he would like to see closer cooperation between the U.S. and Germany in the aircraft field, pertaining to an exchange of technical information with the aim of using German technical know-how and spare production space to aid Western defense as soon as Germany was legally permitted to have a defense industry. Hurley was quoted as speaking as a representative of the American industry, which was denied by AIA.

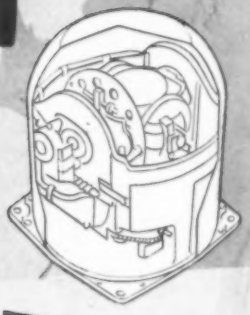
## Boeing Subcontracts

Boeing Airplane Co. has awarded additional subcontracts to Cessna Aircraft Co. and Fairchild Aircraft Division, covering, respectively, $10,000,000 worth of contracts for extension of work on B-47 jet bomber; and an additional quantity of outer wing panels and vertical fins for the Boeing B-52 jet bomber. In addition, Cessna received $7,000,000 worth of orders from Lockheed for component parts for the T-33 jet trainer.

# pushing precision toward perfection

Eclipse-Pioneer's "Polar Path" system guided the first commercial over-the-Pole flight* with such accuracy that the log of the now-famous Scandinavian Airlines System's flight carried the notation "works to a miracle". How was it possible to produce this gyro that actually proved to have less than 1° random drift? Admittedly, it was a special gyro, but the answer nevertheless lies in advanced production techniques and facilities that are pushing gyroscope precision toward perfection. Today, *even machining* of gyro parts is being accomplished at E-P in a specially constructed, atmosphere-controlled room where castings "soak" for 36 hours to assure stability of carefully machined tolerances—where electronic air cleaners snatch up foreign particles so fatal to delicate mechanisms—where specially constructed machines automatically hold split-hair tolerances as a matter of routine and surface finishes are maintained to the incredible limits of the thickness of a single light band. In the entire industry, only Eclipse-Pioneer can offer precision mass-production facilities like these—facilities that literally are pushing gyro precision toward perfection.

*NOVEMBER 20, 1952



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# WARMING UP FOR THE BIG RACE -

**AT SQUANTUM ON THE BOSTON HARBOR,** huge throngs gathered one day in September 1910 to watch the world's most celebrated airmen compete for $100,000 in prizes offered by Harvard Aeronautical Society. Flying 33 miles over water in 34 minutes, 1 1/5 seconds, Claude Grahame-White won the big $10,000 race around Boston Light. His fast aircraft, shown here warming up, also won the speed prize with 5¼ miles in 6 minutes.

*Dramatic contrast to those early days of flight* is this F-86D, latest version of the North American Sabre Jet, now in production. It is rated in the nearly 700 MPH class. Sister models of the 'D' have played a vital role in the air war over Korea, having accounted for a great number of the Red MIG's shot down.

● Superiority of the Sabre can be attributed, in part, to new features such as the "brain box"—a new development introduced on the F-86D model. Among other things, the "brain box" automatically controls the flow of fuel through the engine to bring about the best possible performance.

Phillips Petroleum Company, as one of the country's largest suppliers of aviation fuels, has kept pace with these new developments providing fuels for the very latest super high speed planes . . . for like any engine, an airplane engine is only as good as the fuel that powers it. Phillips also supplies great quantities of 115/145 grade aviation gasolines.

Rely on Phillips for dependable, high-performing aviation products.

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